AMERICA'S LARGEST TEXTILE MONTHLY

COTTON

Entered as second-class matter at the postoffice, Dalton, Ga., under Act of March 3, 1879.

Volume 86
Number Nine
$1.00 a Year.

JULY, 1922

Published monthly by
W. R. C. Smith Publishing Co.
Dalton, and Atlanta, Ga.

NATIONAL U.S.A. DYES

Dependability

AN outstanding requirement of color consuming industries is a dependable source of supply.

¶ Large manufacturing facilities not only make possible the production of a wide and diversified line of dyes, but by creating ample stocks afford a dependable supply to the consumer when he wants it.

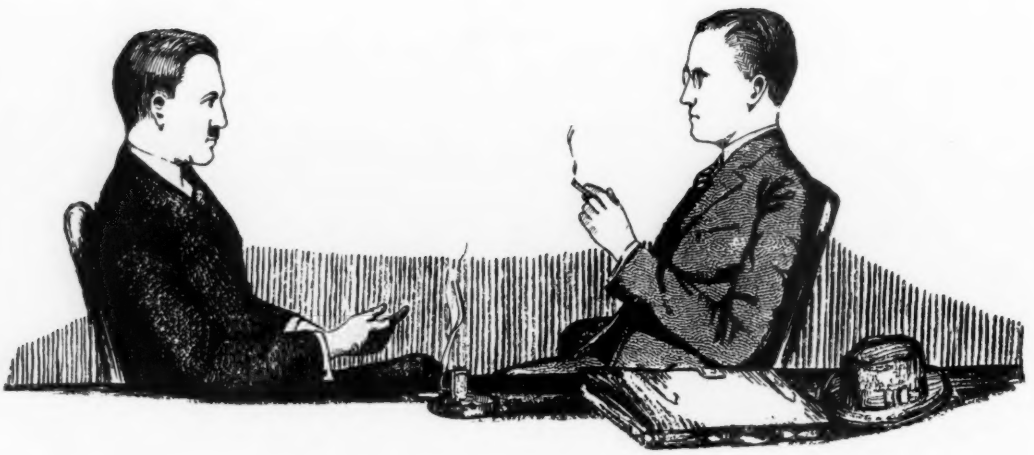
¶ The dyestuff user can, therefore, plan his work with perfect confidence that his needs will be supplied promptly with dyes of an established standard.

National Aniline and Chemical Co., Inc.

New York *Chicago* *Charlotte* *Toronto* *Philadelphia*
Boston *Hartford* *Montreal* *Providence* *San Francisco*

NATIONAL DYES

Table of Contents, page 41. Buyers' Guide, page 286. Advertisers' Index, page 296.



"The Best Sellers We Ever Put Out"

A converter is speaking and is addressing his remarks to a representative of a mill making colored goods.

The "best sellers" that he speaks of are some colored goods that were made for him by the mill just mentioned.

There's a reason for everything. The converter and the salesman both know one very important reason for the success of their goods.

Do **you** know this reason?

It's because the goods were dyed by the Franklin Process.

Franklin dyed goods are very noticeable and easily distinguished because of the unusual brilliancy and solidity of the colors. These colors are exceptionally well penetrated and absolutely fast.

Therefore:—

1.—They are easy to sell and stay sold.

2.—Converters specify Franklin colors because they are dependable, and because they assist in making their goods "best sellers."

If you do not already have your dyeing done in one of our plants, we suggest that you send us your next order. The fact that you use Franklin dyed goods will be something that you can merchandise to the converters with good effect.

Ship your yarn to us on cones, packages and parallel tubes. We will dye it and return it to you on parallel tubes ready for the V creel.

We shall be glad to send our color card and prices upon request.

FRANKLIN PROCESS CO.

Philadelphia PROVIDENCE Manchester, Eng.

New York Office, 72 Leonard Street

SOUTHERN FRANKLIN PROCESS CO.

Greenville, S. C.

NORTHROP

TRADE-MARK REG U S PAT OFF

LOOMS

ON COTTON GOODS

AND MOST WORSTEDS THAT CAN BE WOVEN

WITH ONE SHUTTLE

SAVE 50 TO 75 PER CENT

OF THE LABOR COST OF WEAVING

AND

PRODUCE BETTER GOODS

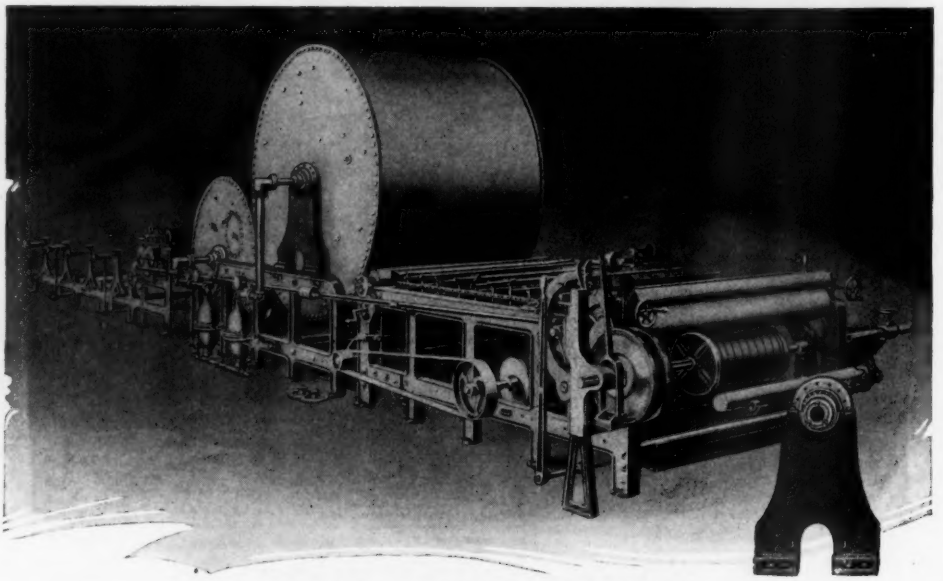
DRAPER CORPORATION

HOPEDALE MASSACHUSETTS

ATLANTA GEORGIA

Copyright 1917 by Draper Corporation

SKF



No Weak Inelastic Warps From Ball Bearing Equipped Slashers

IF slasher cylinders stick and are hard to start, warps are unduly strained and lose much, if not all, of their original and natural elasticity. Inelastic yarn breaks easily in weaving, interrupting production and increasing "seconds."

These troubles, so common where most types of bearings are used, are eliminated when cylinders are equipped with **SKF** marked self-aligning ball bearings. Cylinders thus mounted start easily on a pull of less than a pound as compared with 7½ to 20 pounds required where other types of bearings are used. As a result the tension on the warps is kept at a minimum and the original elasticity is retained.

Self-aligning ball bearings are practically frictionless, show no appreciable wear, cannot heat, stick nor bind and require no adjustment. Engineering details on request.

THE SKAYEF BALL BEARING COMPANY

778 Supervised by **SKF** INDUSTRIES, INC., 165 Broadway, New York City

Normal View

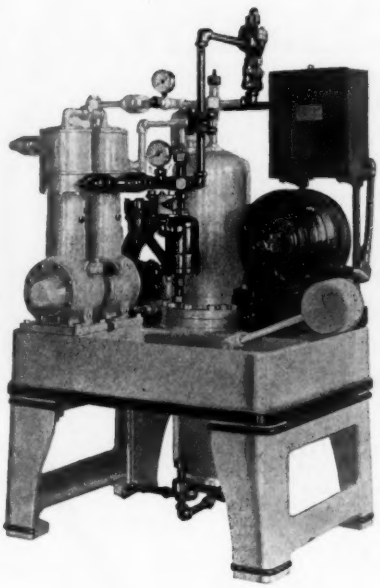
Deflected View

BALL BEARINGS
The Highest Expression of the Bearing Principle

Lipman

FULL-AUTOMATIC REFRIGERATING MACHINES

Drinking Water Systems



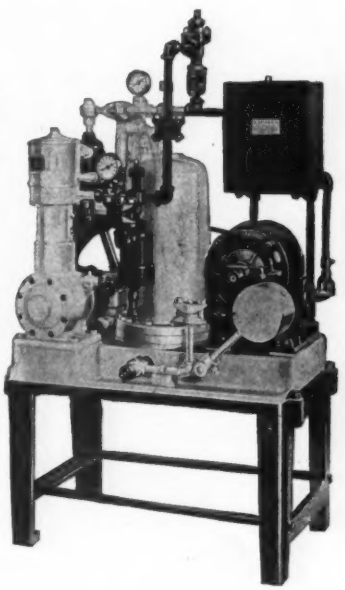
"MODERNIZE"

Supply your Workers with a constant supply of Cool, Palatable Drinking Water at a UNIFORM temperature the year round.

—SAVE—

By eliminating the tremendous cost and the unsanitary features of the Old Icing Methods.

Increased Efficiency Means Increased Production. Cool water at a constant even temperature increases the efficiency of your Workers.



Automatic---Efficient---Economical

The Ideal System

The Lipman Automatic Drinking Water System, with drinking fountains located at convenient points, is solving the problem with remarkable success in a large number of factories throughout the country.

An ammonia machine with automatic mercury control is the basis of the excellent cooling feature of the Lipman Drinking Water System. The mercury control automatically starts the machine, when the temperature reaches a point above that at which the control is set. When the proper temperature is gained the machine is automatically stopped by the mercury control. Everything is automatically operated, and no special engineer or mechanic is required to operate and maintain the Lipman Drinking Water System.

It is much more economical than the bucket and dipper method—more economical than fountains each individually iced several times during the day. It pays for itself in less than two years' time.

Your Particular Mill

Our engineers, experienced in solving cooling and refrigeration problems, will be pleased to call upon you, figure out the size machine you require and solve your Drinking Water Problems.

Our installations are backed by our guarantee. The mill must be more than satisfied with the equipment and operation.

WRITE FOR COMPLETE INFORMATION

Miles Refrigerating Company

292 Peachtree Street, Atlanta, Ga.

FAFNIR

Just the Thing for Light Drives And Machine Applications.

There has long been a real need for an economical and efficient ball bearing box for light drives, such as countershafts, textile dryers and many other machine applications.

Fafnir Single Ball Bearing Hanger Boxes meet this demand completely. They involve unit construction, are easily installed, no wear comes on the shaft, and all loads are carried by the balls with practically no friction.

They save a vast amount of power, require oiling but once in several months, promote perfect cleanliness, repairs are eliminated, and far better service is permanently assured.

Fafnir Single Ball Bearing Hanger Boxes are low in cost and will pay for themselves many times over in power saving alone. Every factory and machine builder needs them.

The Red Dragon Line.

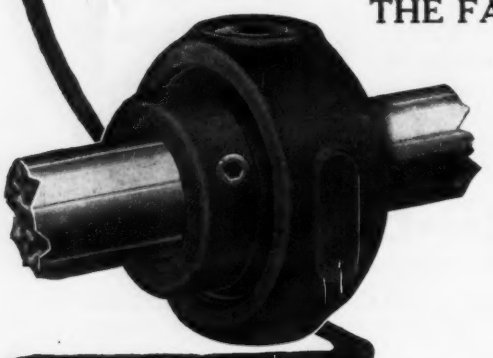
THE FAFNIR BEARING COMPANY

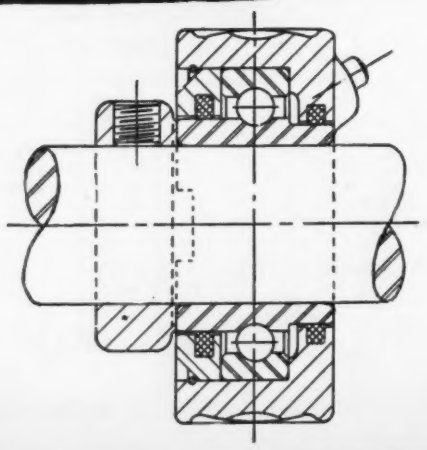
Conrad Patent Licensee

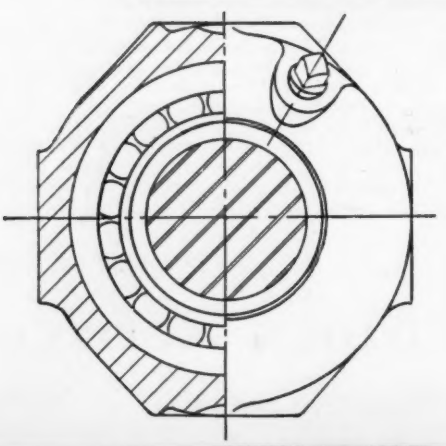
New Britain, Conn.

DETROIT Office: 752 David Whitney Bldg.
CLEVELAND Office: 1016-1017 Swetland Bldg.
CHICAGO Office: 537 So. Dearborn St.
NEW YORK Office: 5 Columbus Circle.

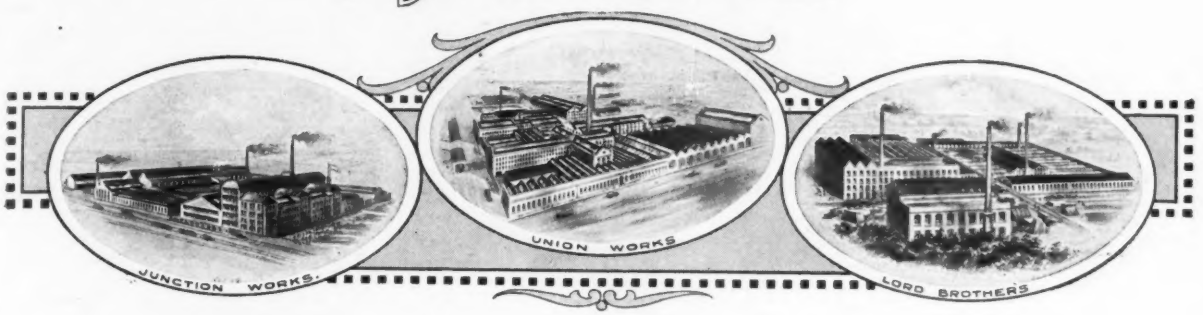
Southern Representative,
O. R. S. Pool,
P. O. Box 1375, Greenville, S. C.







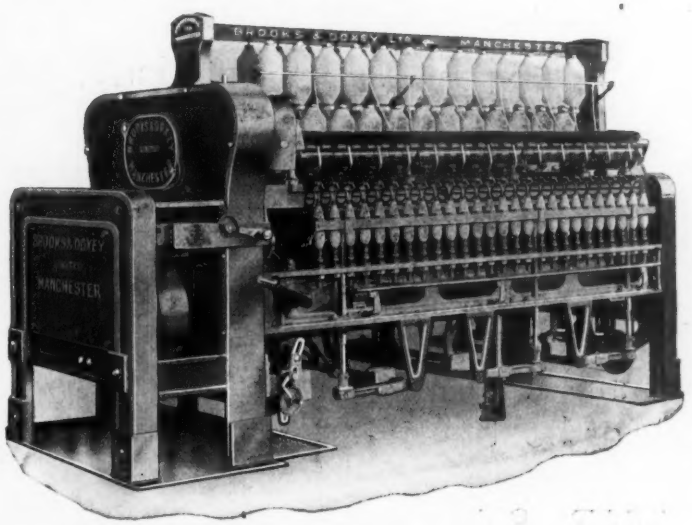
BROOKS & DOXEY
(1920) LIMITED



TEXTILE MACHINERY MAKERS
For the Cotton, Cotton Waste, Wool and Silk Trades

Mixing, Opening, Carding, Preparing, Spinning, Winding, and Doubling Machinery for Cotton; Machinery for Waste Opening, Carding and Spinning on Various Systems; self-acting Mules and Cheese Winders for Wool. Polishing Machines for Sewing Thread;

Cables:
"UNION Manchester, Eng."



RING SPINNING FRAME FOR TWIST
Frame ends and spring-pieces made with loose feet to adjust to uneven flooring. Rollers carried on strong angle beams supported by spring-pieces; framing stiffened by specially-constructed girder rails which carry spindles, ring rails and lifting motion. The whole frame is rigidly braced together to ensure freedom from vibration when spinning at high speeds.

Patent Conditioning Machine for Yarn on Ring Bobbins; Patent Splicing Machine for the "Knotless" Yarn Trade; Roving Waste Openers; Thread Extractors; and Spinning and Doubling Frames for Silk. Also of Tin Rollers, Fluted and Plain Rollers, Spinning and Doubling Spindles, Rings, etc.

Codes:
A.B.C. 5th, Lieber's, Bentley's, A.1.
and
Western Union
(Universal)

HEAD OFFICE:- UNION IRON WORKS, WEST GORTON, MANCHESTER, ENG.

INCORPORATING LORD BROS. TODMORDEN.

STAFFORD

AUTOMATIC LOOMS

For Wide Sheetings

The Stafford broad loom is built to withstand severe service. Its simplicity, accessibility of parts and ease of operation are a few reasons why it is used by some of the most representative wide goods mills.

This loom embodies the high weaving qualities that characterize other Stafford looms and it can now be supplied with either shuttle or bobbin changing automatic features.

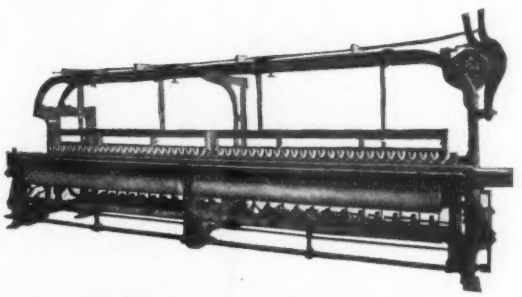
THE STAFFORD COMPANY

READVILLE, MASS.

Southern Agent, J. H. MAYES, Charlotte, N. C.

PLANT OF THE STAFFORD COMPANY, READVILLE, MASS.

Fletcher Cotton Tape Loom —Beam Let-Off—

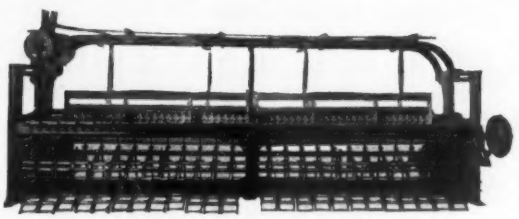


Front View of Two Section Tape Loom

A Profitable Loom for Weaving

STAY BINDING — CORSET TAPE — SUPERFINE TAPE

Simplicity of design and ease of operation make this loom especially suitable for girl operators.



Its high speed and dependable construction insure rapid and continuous production.

Back View, Showing Beam Let-off

Length of loom to suit your mill space

FLETCHER WORKS

(FORMERLY SCHAUM & UHLINGER)

Glenwood Avenue, at Second Street, Philadelphia, U. S. A.

Also Manufacturers of

FLETCHER HIGH SPEED RIBBON LOOMS **FLETCHER ELASTIC WEBBING LOOMS**
FLETCHER HEAVY WEBBING LOOMS **FLETCHER ASBESTOS LOOMS**
FLETCHER CENTRIFUGAL EXTRACTORS

New Developments In Card Drive

At the Fabric plant of the Mason Tire and Rubber Company, Kent, Ohio, Westinghouse has developed a geared, individual motor drive for Cards.

Stripping, doffing, grinding, and the normal operation of the Card is satisfactorily performed by this individual drive.

In addition, line shafting, hangers and belting have been eliminated, and the maximum uniform speed secured, assuring greater production.

Westinghouse

Thus, the economies of individual motor drive are brought to the Card—the only machine not previously individually driven successfully.

Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pa.
Sales Offices in All Principal American Cities

Westinghouse

L-V-B SPOOLER TENSION

L-V-B Tension Device.

Here's What One Mill Saves

In a mill that changed from warp to filling wind on 20,000 lbs. production, the following result was obtained:

Warp Wind	Filling Wind
Stick Waste 80%	Stick Waste 60%
Spooler Waste 200 lbs.	Spooler Waste 50 lbs.
1050 doffs.	650 doffs.

Increased production 5% due to less doffing and less breakage.
Changed warp bobbins 7 15/16 to filling bobbins 8¾".
Increased speed of spooler from 800 R.P.M. to 1200 R.P.M.
Eliminated 1/3 of spoolers; also improvement on slashing, warping and weaving.

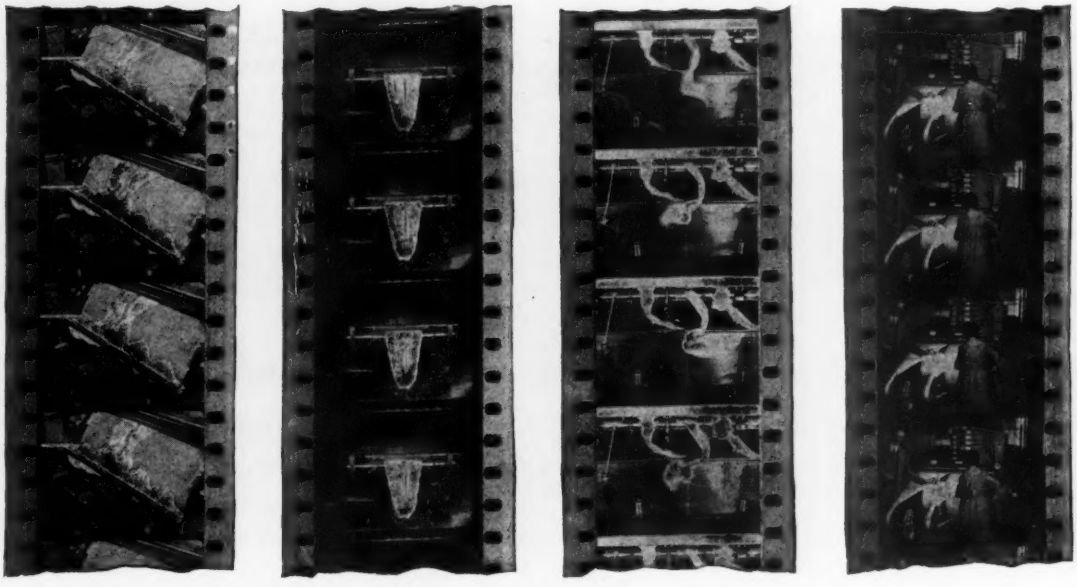
Change from Warp to Filling Wind. Try it out at our expense.
Send 2 filled bobbins and we will forward sample tension on approval.
The L-V-B Spooler Tension means greater production, better spinning and 50% Saving in Waste. Ask for a list of mills that are using L-V-B Tensions.

ADDRESS

Textile Specialty Company

P. O. Box 531, New Bedford, Mass

A. B. Carter, Southern Agent, L-V-B Tension Co., 210 Realty Bldg., Gastonia, N. C.



Seeing Thirsty Cotton with Movies

We've been telling you for some time of the loss from allowing your cotton to become thirsty.

All the manufacturing operations in a cotton mill tend to make it thirstier as it goes through until at the time of shipment its thirst may cost you as much as $5.00 a bale. Figures and charts are a cold medium of expression and we have long wished to be able to show in pictures just how and when these losses occur.

Through months of experiment and patient research work we are now able to announce the completion of a scientific film showing direct comparisons of good and bad conditions.

This film is entirely different from the usual industrial film. The pictures are taken close-up and by the ingenious slowing down process combined with magnification one can see the operation and behavior of the fibre during the different processes and just what effect moisture has.

Imagine being able to see a flyer that normally revolves at 900 revolutions per minute photographed as if it were running only 120 revolutions and showing all of the defects due to dry condition of the cotton in the sliver.

Magnification and the slow motion camera provide you with ten times as much eyesight, capable of seeing ten times as fast.

Subject to previous schedule, arrangements may be made to show the film in your locality. Write us.

Parks-Cramer Company

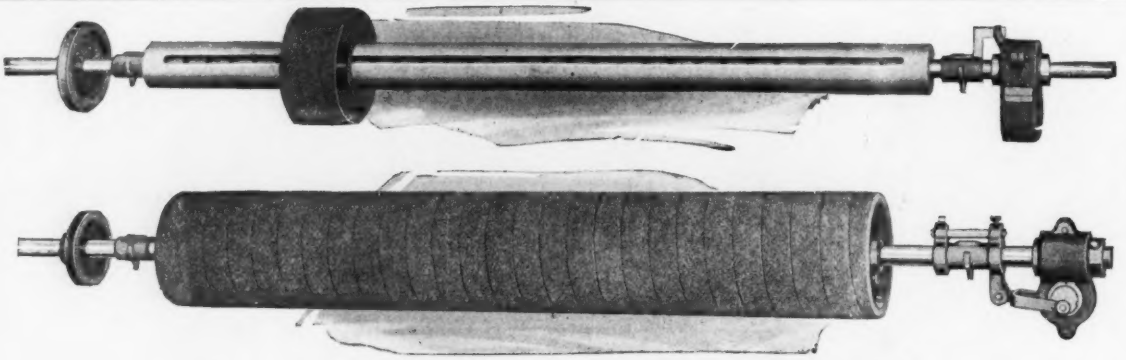
Engineers & Contractors

Industrial Piping and Air Conditioning

Fitchburg Boston Charlotte

Right Region

Copyright 1922 P. C. Co.



Get a Set of These Roy Grinders

The set includes two Improved Roy Screw Traverse Grinders and one Improved Roy Steel Roller Grinder.

They will be sent f. o. b. Worcester, Mass., to any reputable concern using Revolving Flat Cards. We feel that nothing we could say about these Grinders would be more convincing than the Grinders themselves. We will be pleased to let one of these sets "speak for itself" in *your* plant.

Further information gladly furnished on request

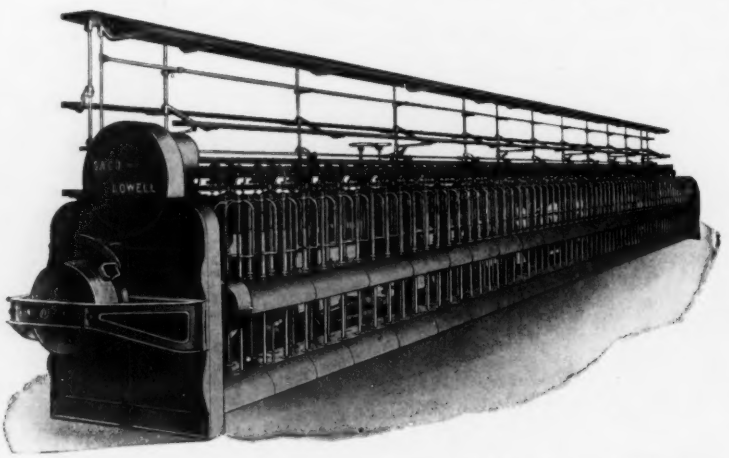
B. S. Roy & Son Co., Worcester, Mass.

ESTABLISHED 1868

E. M. TERRYBERRY, *Southern Agent*
1126 Healey Bldg., Atlanta, Ga.

Canadian Representative
W. J. WESTAWAY CO., LTD.,
Hamilton, Ontario

SACO-LOWELL SHOPS
TEXTILE MACHINERY



Our Improved Roving Frames are economical to operate and give satisfactory service.

Slubbers, Intermediates, Fine Frames and Jacks for all counts of roving. Catalog on request.

EXECUTIVE OFFICES, 77 FRANKLIN STREET, BOSTON, MASS.

SHOPS AT

LOWELL, MASS. NEWTON UPPER FALLS, MASS. BIDDEFORD, MAINE.

ROGERS W. DAVIS, SOUTHERN AGENT, CHARLOTTE, N. C.

SOUTHERN BRANCH OFFICE, GREENVILLE, S. C.

MANUFACTURER

Meet Your Market at the

First National Merchandise Fair

Under the Auspices of the

National Retail Dry Goods Association

With the Cooperation of the

National Garment Retailers Association

GRAND CENTRAL PALACE and 71st REGIMENT ARMORY

NEW YORK, AUGUST 7th to 25th

FOR MERCHANDISE BUYERS ONLY

You never saw so many customers and prospects together at any one time and place as you will see at the National Merchandise Fair. All waiting to be shown. All willing to compare. All wanting to buy. To miss displaying your lines at the Fair would be like closing your show rooms for the three busiest weeks you ever knew.

YES, YOU CAN SELL. This is not a localized merchandise event, but a NATIONAL SELLING FAIR. The dates, the place, the men behind the enterprise—everything connected with the Fair is an invitation to buy and buy and buy. Dry Goods and Department Store Buyers from every corner of the country are coming with the set purpose of centralizing their buying efforts for the season on this Fair. For these three weeks in August the National Merchandise Fair will be THE NATIONAL MARKET.

Don't fail to be represented. Choose your space early and get the most desirable remaining locations. By restricting the space available to any individual manufacturer we think we have enough to go around. But don't delay too long. Among the lines permitted to be shown are: Notions, Silks, Woolen Dress Goods, Cotton Goods, Linens, Hosiery, Underwear, Negligee Wear, House Dresses, Aprons, Infants' Wear, Art Needlework, Gloves, Neckwear, Embroidery, Handkerchiefs, Trimmings and Laces, Toilet Articles, Ivory, Jewelry, Silver and Clocks, Leather Goods, Gift Merchandise, Curtains, Domestic Lamps, Cutlery, Glassware, Stationery, Umbrellas, Hand Luggage, Coat Suits, Dresses, Waists, Skirts, Corsets, Furs, Sweaters, Misses' and Children's Wear.

GENERAL EXECUTIVE COMMITTEE: Michael Friedsam, Chairman, B. Altman & Co., New York; George W. Mitton, Jordan Marsh Co., Boston; Samuel Mundheim, Kauffman Dept. Store, Inc., Pittsburgh; L. C. Nash, Burgess-Nash Co., Omaha; Samuel W. Reyburn, Lord and Taylor, New York; Franklin Simon, Franklin Simon & Co., New York; Elmer T. Stevens, Chas. A. Stevens & Bros., Chicago; Percy S. Straus, R. H. Macy & Co., Inc., New York; Oscar Webber, The J. L. Hudson Co., Detroit; Ira M. Younker, Younker Brothers, Inc., Des Moines; M. L. Wilkinson, Scruggs-Vardervoort-Barney Dry Goods Co., St. Louis; and, representing the GARMENT DIVISION: J. P. Allen, J. P. Allen & Co., Atlanta; E. J. Magnin, I. Magnin & Co., San Francisco; J. B. Shea, Joseph Horne & Co., Pittsburgh; Leo C. Fuller, Stix, Baer & Fuller Dry Goods Co., St. Louis; Max Hellman, The Lindner Co'y., Cleveland; Warren Short, E. E. Atkinson & Co., Minneapolis; I. D. Levy, Oppenheim Collins Co., Charles Gimbel, Gimbel Brothers; Max Neusteter, Neusteter Co., Denver; P. A. O'Connell, S. T. Slattery Co., Boston.

WAYS AND MEANS COMMITTEE: Ira M. Younker, Chairman, Younker Brothers, Inc., Des Moines; L. Simon Plaut, L. S. Plaut & Co., Newark; Alfred B. Koch, the La Salle & Koch Co., Toledo; Lew Hahn, Managing Director, National Retail Dry Goods Association; and, representing the GARMENT DIVISION: Franklin Simon, Chairman, Franklin Simon & Co., New York; Harry Hairy, L. Bamberger & Co., Newark; P. A. O'Connell; S. H. Goldberg, New York; Oscar Abel, New York; I. D. Levy; Clay Myers, Joseph Horne Co., John W. Hahn, Executive Secretary, National Garment Retailers' Association.

MERCHANTS. Inquire for particulars.

MANUFACTURERS. Arrange at once for display and selling space. Diagram of booths, with prices and complete information upon request of

NATIONAL MERCHANDISE FAIR

200 Fifth Avenue **New York**

A National Selling Fair—Not a Localized Market Event

The J. H. WILLIAMS CO.

O. K. Automatic Shuttles
Wire Heddles, Heddle Frames

MILLBURY, MASS.

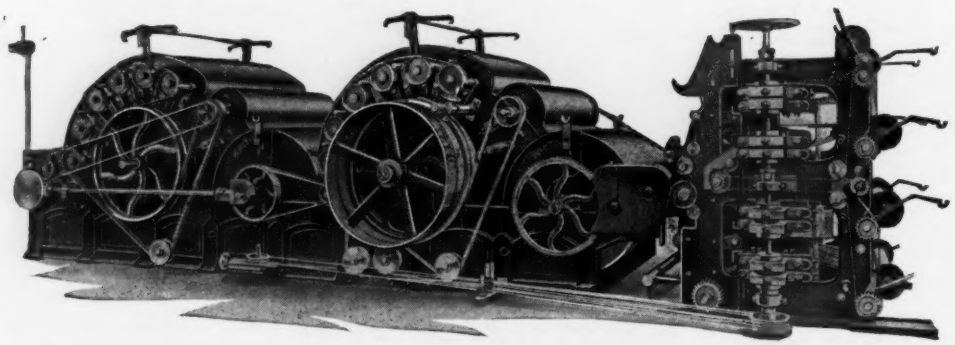
WHITIN MACHINE WORKS

ESTABLISHED 1831

TEXTILE MACHINERY

MANUFACTURERS OF

Complete Condenser Plants for Wool and Cotton Waste Yarns



Intermediate and Finisher Cards with Four-Bank Condenser

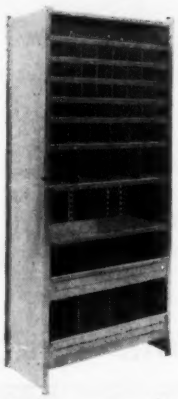
MAIN OFFICE AND WORKS

WHITINSVILLE, MASS., U.S.A.

SOUTHERN OFFICE CHARLOTTE N.C.

LYON STEEL PRODUCTS

Steel Storage Equipment



Carding room supply cabinet for draft gears, spinning rolls, saddles, stirrups, etc. Creates order and cleanliness.

Experienced textile men have helped us produce these Lyon products.

Due to their extreme practical economy these items are now standard equipment in modern textile mills.

They are a sensible money saving investment because of the reduction effected in supply stock investments. A properly laid out store room, plus a little system, keeps the supply stock at a minimum, yet provides means for having just what is wanted in emergencies.

Our engineers are at your service, without obligation.

For sewing machine, knitting machine and other small parts. Drawers divided and subdivided into small, compartments, each bearing a label so that any part may be instantly located. Cabinet fitted with lock.

Spool, roving and bobbin truck One of those Lyon-made products that give absoulte satisfaction.

Made entirely of steel, these tables are subject to the most rigid inspection. No rough edges project to catch threads. Splinters are entirely eliminated. Easily kept clean, fire-proof and exceptionally durable. The ideal fixture for hand-inspecting folders, etc. Price and economy, too.

Lyon Metallic Manufacturing Company

Aurora, Illinois

New York Chicago Boston Philadelphia Cleveland
Pittsburgh Rochester Detroit Los Angeles

"Everlastingly on the Job"

FROM sun-up to sun-down, and far into the night when necessary, SHAMBOW Shuttles keep "everlastingly on the job."

Every part of a SHAMBOW Shuttle is made under our own roof and measurements, spindle fit, etc., must be in exact accord with customers' specifications and requirements.

Every SHAMBOW Shuttle passes a close final inspection, and in every detail must reach the "SHAMBOW Standard" to get by.

Insist on a shuttle of genuine SHAMBOW Standard and be assured that

Your shuttle bill will be smaller
Your interruptions will be fewer
Your production will be greater
Your product will be better.

SHAMBOW SHUTTLE COMPANY

Woonsocket, R. I., U. S. A.

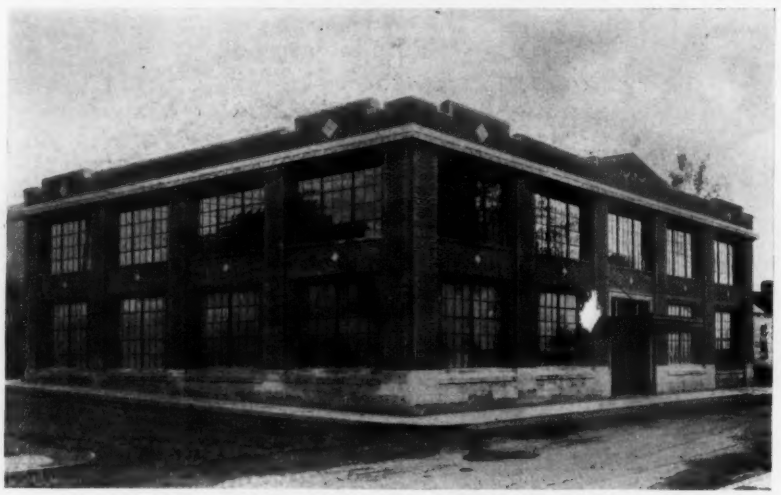
John C. Shambow
Pres. and Treas.

H. H. Ullman
V. Pres. and Gen. Mgr.

"HEART of the LOOM"

SHAMBOW

—The Custom Built Shuttle



New Southern Warehouse

Exclusively for

CROMPTON & KNOWLES PARTS

Large Stock Carried — Quick Service

Alexander & Garsed

Charlotte N. C.

Southern Representatives.

Huge Reinforced slag concrete mill of the Peerless Cotton Mills at Thomaston, Ga. "Ensley Basic Slag" was used exclusively as the coarse aggregate in this concrete, fireproof structure. Algernon Blair, Montgomery, Ala., contractor.

Standard Mill Construction usually means Reinforced Slag Concrete using

"ENSLEY" & "ALA CITY"
BASIC SLAG
CRUSHED & SCREENED

as the coarse aggregate for these five sound reasons

Cleanliness

The heat of the furnace reduces all ingredients of the slag into a single molten mass, insuring the absence of loam and other mineral or earthly matter.

Angularity

Whether granulated into sand or broken into coarsest aggregate, the particles of slag are crystalline fractures with many faceted sides. This angularity of fracture causes slag to pack densely when used alone and bond tightly when mixed with Asphalt or Cement.

Toughness

"Ensley Basic Slag" and "Alabama City Basic Slag" are greater in strength than stone, granite or gravel. Each has, in every test, substantiated our claims that it is highly refractory and practically indestructible.

Gradation

Our modern crushing and screening plants enable us to produce a material more perfectly graded than any other coarse aggregate.

Service

Our two big plants have a combined capacity of 6,000 tons of crushed and screened Basic Slag per day. Prompt shipments over 12 railroads at favorable "delivered" prices to all points in the Southeast.

Call—Phone—
Write—Wire

Birmingham Slag Company

Slag Headquarters for the South

Atlanta BIRMINGHAM Thomasville

"Everlastingly on the Job"

FROM sun-up to sun-down, and far into the night when necessary, SHAMBOW Shuttles keep "everlastingly on the job."

Every part of a SHAMBOW Shuttle is made under our own roof and measurements, spindle fit, etc., must be in exact accord with customers' specifications and requirements.

Every SHAMBOW Shuttle passes a close final inspection, and in every detail must reach the "SHAMBOW Standard" to get by.

Insist on a shuttle of genuine SHAMBOW Standard and be assured that

Your shuttle bill will be smaller
Your interruptions will be fewer
Your production will be greater
Your product will be better.

SHAMBOW SHUTTLE COMPANY

Woonsocket, R. I., U. S. A.

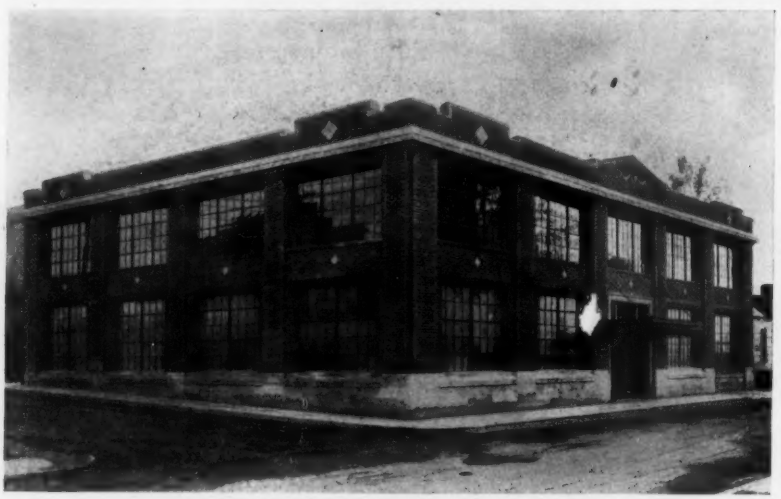
John C. Shambow
Pres. and Treas.

H. H. Ullman
V. Pres. and Gen. Mgr.

"HEART of the LOOM"

SHAMBOW

—The Custom Built Shuttle



New Southern Warehouse

Exclusively for

CROMPTON & KNOWLES PARTS

Large Stock Carried — Quick Service

Alexander & Garsed

Charlotte N. C.

Southern Representatives.

Huge Reinforced slag concrete mill of the Peerless Cotton Mills at Thomaston, Ga. "Ensley Basic Slag" was used exclusively as the coarse aggregate in this concrete, fireproof structure. Algernon Blair, Montgomery, Ala., contractor.

Standard Mill Construction usually means Reinforced Slag Concrete using

"ENSLEY" & "ALA CITY"
BASIC SLAG
CRUSHED & SCREENED

as the coarse aggregate for these five sound reasons

Cleanliness

The heat of the furnace reduces all ingredients of the slag into a single molten mass, insuring the absence of loam and other mineral or earthly matter.

Angularity

Whether granulated into sand or broken into coarsest aggregate, the particles of slag are crystalline fractures with many faceted sides. This angularity of fracture causes slag to pack densely when used alone and bond tightly when mixed with Asphalt or Cement.

Toughness

"Ensley Basic Slag" and "Alabama City Basic Slag" are greater in strength than stone, granite or gravel. Each has, in every test, substantiated our claims that it is highly refractory and practically indestructible.

Gradation

Our modern crushing and screening plants enable us to produce a material more perfectly graded than any other coarse aggregate.

Service

Our two big plants have a combined capacity of 6,000 tons of crushed and screened Basic Slag per day. Prompt shipments over 12 railroads at favorable "delivered" prices to all points in the Southeast.

Call—Phone—
Write—Wire

Birmingham Slag Company

Slag Headquarters for the South

Atlanta BIRMINGHAM Thomasville

Merrimac Mfg. Co.
Huntsville, Ala.

Indian Head Cotton Mills
Cordova, Ala.

"Eva Jane" Mill
Avondale Mills
Sylacauga, Ala.

ALAB

Industry's

Roger W. Babson, the greatest statistical expert in the United States, says to industry "GO SOUTH."

Mr. Babson, in a recent statistical survey of the forty-eight states, found that Alabama ranked first as being the best location, all conditions considered, for the establishment of great industrial enterprises. "Our investigation," said Mr. Babson, "disclosed that Alabama, from all standpoints, climate, expense, material, labor, etc., stood at the top of the list. There is no longer any reason," continued Mr. Babson, "for a young man going West or to South America. In my opinion, the South Atlantic states offer the best opportunity to that of any country in the world for the energies of young, ambitious men, and among Southeastern states, I place Alabama at the head of the list."

MARKETS

75,000,000 people populating thirty-seven states of the Union constitute the natural market for the output of textile mills located in Alabama.

RAW MATERIALS

Raw materials are abundant and in

Write us freely fo

Alabama Po

BIRMINGHA

BAMA

s Opportunity

close proximity to mills. Cotton of all grades can be purchased direct locally without any freight charges.

TRANSPORTATION

Ten large railroad systems give Alabama manufactured products trunk line shipping facilities to all markets of the United States, as well as to the ports of Mobile and New Orleans; thence to all foreign markets.

LABOR

Alabama has dependable textile mill help—all are pure Anglo-Saxons, all reading, writing and talking the English language, all anxious to work.

POWER

Hydro-electric power, with large steam reserves, is available throughout the year. There is no shortage of power in Alabama from droughts, etc. Alabama coal mines are at your door with a cheap and dependable fuel supply.

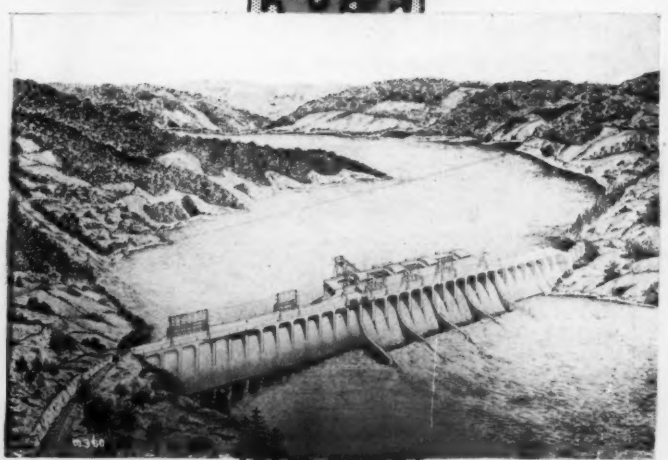
ALABAMA is truly the logical location for your new plant, or a branch plant.

ely fo pecial information

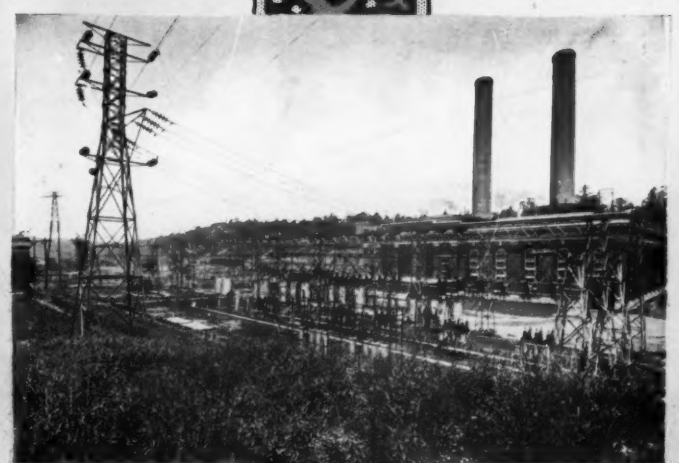
ower Company

IA, ALABAMA

Lock 12 now developing—
110,000 H. P. Coosa River.



Mitchell Dam as it will appear.
Now under construction—
110,000 H. P.



Warrior Reserve Steam
Plant—75,000 H. P.

OWNERS' FAITH
in
WHITE TRUCKS

The *faith* truck owners have in White equipment! Of the large fleet owners 105 have invested over $100,000 each in White Trucks:

36 over	$ 250,000 each
16 over	500,000 each
10 over	1,000,000 each
3 over	2,000,000 each
1 over	3,000,000

Experienced users *know* truck value. They continue to purchase White Trucks year after year.

THE WHITE COMPANY
Cleveland

21 YEARS OF KNOWING HOW

Actual Savings Over Cost of Ice Quickly Pays For This Machine

INSTALLATIONS of this perfect little ice-making equipment in other mills has shown remarkable savings over the cost of purchasing ice. The actual savings effected quickly paid for the system, to say nothing of the savings of food products and the profits from the sale of ice to employees and the better health and sanitation throughout the mill and village.

A number of mills and finishing plants are using "Southern" Ice Making and Refrigerating Equipment for different purposes—for the cooling of water for piping to drinking fountains—for making ice for use throughout the mill and for sale to employees—for a refrigerating room for conserving the perishable food supply for the community store and market—for cooling chemicals and dyes in finishing rooms and dye plants, and many other uses.

If your ice costs are $1.00 to $1.50 per day, a "Southern" equipment will prove a paying investment for your mill.

We render to textile mills a service they cannot secure elsewhere. Without obligation on your part, we will make a complete survey of your local conditions and tell you whether a "Southern" equipment will prove a good investment or not and furnish specifications and costs for installation of the equipment that will insure a good investment.

May we send literature?

Southern Ice Machine Co., Charlotte, N. C.

Southern

IMPROVED

ICE AND REFRIGERATING MACHINES

WE HAVE A SPECIAL DEPARTMENT
TO CARE FOR YOUR BOOKINGS OF

MOVING PICTURES

FREE FROM—STRIFE, NUDITY,
IMMORALITY, BATHING GIRLS,
GUNPLAY, MURDERS, ETC.,
INSURING YOUR AUDIENCES

CLEAN PICTURES

WRITE OR WIRE
NATIONAL EXCHANGES, INC.
SAVINI FILMS, INCORPORATED
63 WALTON STREET
ATLANTA, GEORGIA

NOVELTIES

ACTION WESTERNS
STARRING
Neal Hart and Wm. (Bill) Fairbanks

SERIALS

Released one every week Twelve Fairbanks, eight Harts. The newest product of these stars.

"Go Get Him," "Broadway Buckaroo","A Western Demon, "Hell's Border" the first four titles

FEATTURES

Drop Us a Line for Quotations

Southern States Film Co.
111 Walton St., Atlanta, Ga.

COMEDIES

MOVING PICTURE
ATTRACTIONS

—THAT WILL—
PLEASE YOU & PLEASE YOUR PATRONS

PICTURES
THAT WILL FILL YOUR THEATRE
FILL YOUR POCKETS
AND FILL YOUR OPEN DATES

Arthur C. Bromberg Attractions
61 WALTON ST., ATLANTA, GA.

We can serve you with

Thrilling Western Features

High Class Comedies

and

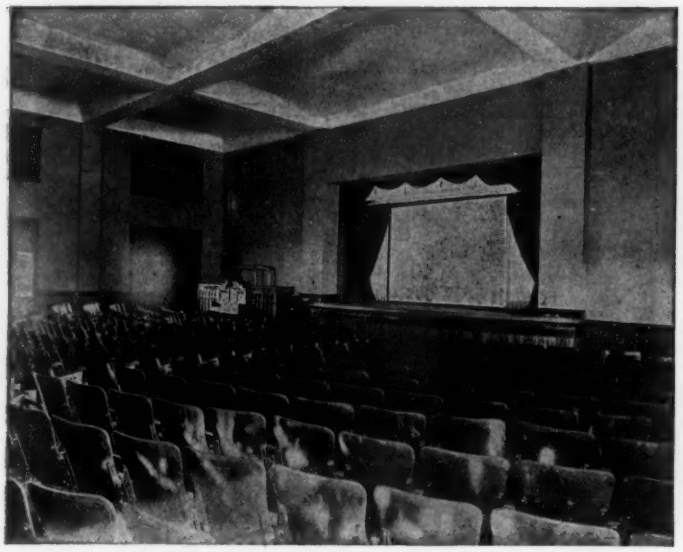
A Big Animal Serial

All we ask is a trial.

Federated Films of Atlanta
146 Marietta St. Atlanta, Ga.

Is Your Name Written There?

Our service to the textile mills is the result of years of experience in installing textile theatre equipment. Our representatives call upon the mills personally, lay out the plans, advise on the proper equipment required and finally supervise the installation and the starting of the theatre. In other words, they take the whole problem off from your hands and do not turn over the work to you until the theatre is operating satisfactorily.



A Typical Textile Mill Theatre.

The textile industry is demanding the best moving pictures for their employees and that is why they regularly specify

POWER'S PROJECTORS

That is why more Power's Projectors are used by textile mills in the South than all other projectors combined.

Satisfied Users of POWER'S PROJECTORS

ALABAMA

W. A. Handley Mfg. Co.	Roanoke
Tallassee Mills	Tallassee
Fairfax Mill	Fairfax
Avon Mills	Sylacauga
Lanett Cotton Mills	Lanett
Indian Head Mills	Cordova
Selma Mfg. Co.	Selma

GEORGIA

Elm City Cotton Mills	La Grange
Bibb Mfg. Co.	Porterdale
Roswell Mfg. Co.	Roswell
Gainesville Cotton Mill	Gainesville
Bibb Mfg. Co.	Columbus
Pacolet Mfg. Co.	New Holland
Manchester Cotton Mills	Manchester
Milstead Mfg. Co.	Milstead
Thomaston Cotton Mills	Thomaston
Exposition Cotton Mill	Atlanta
Habersham Mill	Habersham
Trion Company	Trion
Union Point Mfg. Co.	Union Point
Hillside Cotton Mill	LaGrange

NORTH CAROLINA

Durham Hosiery Mills	Durham
Pamona Mills	Greensboro
Cleveland Mill & Power Co.	Lawndale
Rodman-Heath Cotton Mills	Waxhaw
Rocky Mount Mills	Rocky Mount
Cherokee Falls Mfg. Co.	Cherokee Falls
Roxboro Cotton Mills	Roxboro
Consolidated Textile Corp.	Burlington
Carolina Cotton & Woolen Mills	Spray

SOUTH CAROLINA

Baldwin Cotton Mills	Chester
Tucapau Mills	Tucapau
Ware Shoals Mfg. Co.	Ware Shoals
Glenn-Lowry Mfg. Co.	Whitmire
Monaghan Mills	Greenville
Drayton Mills	Spartanburg
Victor Mills	Greer
Conestee Mills	Conestee
Kershaw Cotton Mills	Kershaw
Abbeville Cotton Mills	Abbeville
Chesnee Mills	Chesnee
Union-Buffalo Mills	Buffalo
Victor-Monaghan Mills	Seneca
Victor-Monaghan Mills	Jonesville
Pacolet Mfg. Co.	Pacolet
Aragon Mills	Rockhill
Graniteville Mfg. Co.	Vancluse
Woodside Cotton Mills	Greenville
Orr Cotton Mills	Anderson
Issaqueena Mills	Central
Clifton Mfg. Co.	Clifton
D. E. Converse Co.	Glendale
Winnsboro Mills	Winnsboro
Monarch Mills	Lockhart

We carry a complete line of supply parts and equipment at our various branches. Your orders for supply parts will be filled the same day the order is received. Whatever are your needs for your theatre, we can supply them.

We have a special offer for the Textile Mills. May we present it to you?

Southern Theatre Equipment Company

WILLIAM OLDKNOW, President,

No. Nine Nassau St.
ATLANTA, GEORGIA

THREE TWENTY-EIGHT CALIFORNIA ST.,
OKLAHOMA CITY, OKLA.

Eighteen Fifteen Main St.
DALLAS, TEXAS

CAST-IRON HANGERS

"Universal Giant" Ring Oiling Ball and Socket Hangers are made of Cast Iron and are Practically Indestructible.

CAST IRON is the only material that will give the rigidity and strength needed to support Line Shafting.

"UNIVERSAL GIANT" CAST IRON Hangers are non-flexible and hold the shaft in position without bending or working apart.

BALL AND SOCKET ADJUSTMENT reduces friction and insures perfect alignment of shafting.

RING OILING BEARINGS provide positive Automatic Lubrication.

BY INVITATION MEMBER OF

NEW YORK, U.S.A.

T. B. WOOD'S SONS CO., CHAMBERSBURG, PA.

MANUFACTURERS OF SHAFTING, COUPLINGS, SET COLLARS, HANGERS
PILLOW BLOCKS, PULLEYS, ROPE SHEAVES, FRICTION CLUTCHES, BELT TIGHTENERS

Strom BEARINGS

Eliminate Uneven Laps

Uneven laps, the bane of the carder's life, can be practically eliminated by the correct working of the eveners.

Theoretically, no matter how uneven the breaker lap may be, the intermediate and finisher eveners ought to smooth out these inequalities and produce uniform laps. But, if cone belts slip, no matter how much care is taken with openers and breakers, the lap will be irregular in weight when it comes from the finishers.

It stands to reason, therefore, that to keep cone belts from slipping, the apron rollers, evener or feed rolls, and the cone shaft should be mounted on ball bearings. The entire train of rollers that the cone belt pulls will then move so freely that there is little strain on the belt and practically no slip.

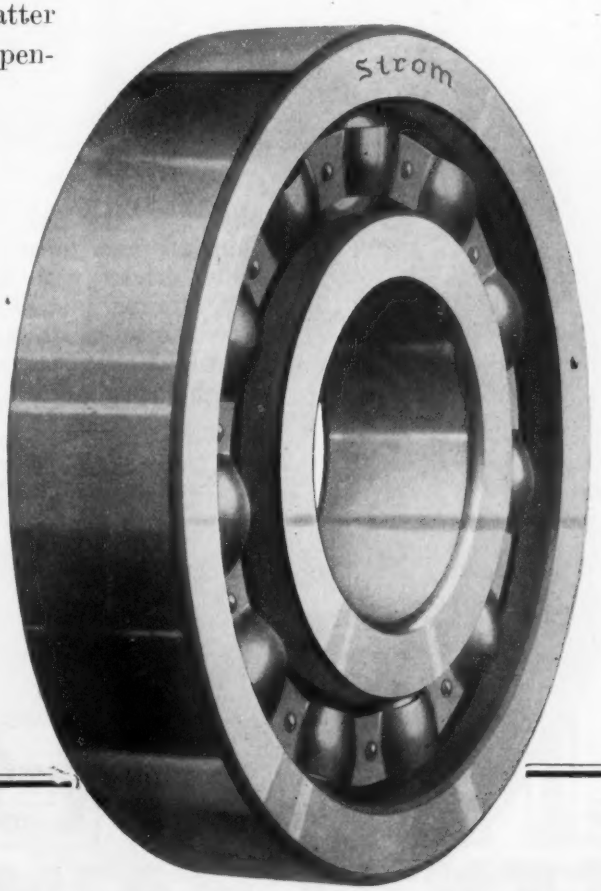
This installation is inexpensive and will reduce the number of laps sent back on account of overweight.

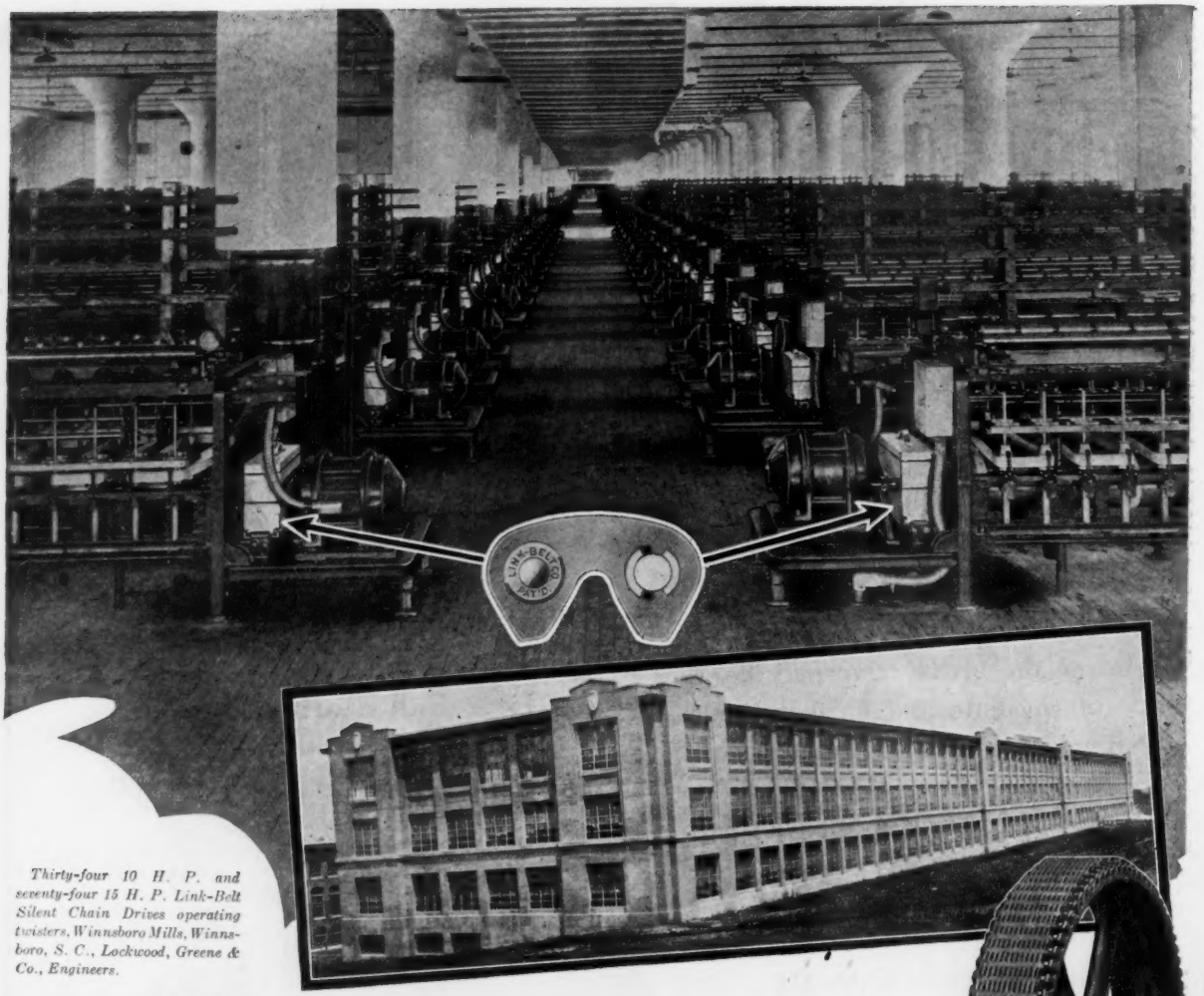
For further information on textile application write the Aldrich Machine Works, Greenwood, S. C.

U. S. Ball Bearing Mfg. Co.

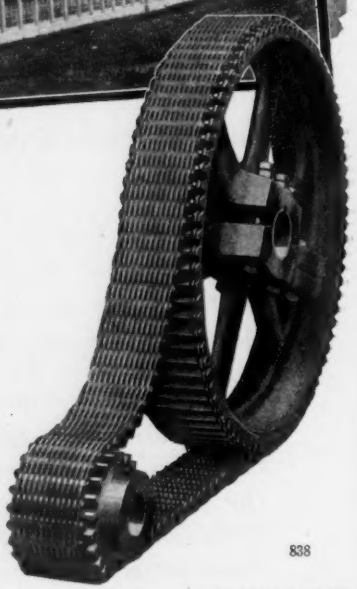
(Conrad Patent Licensee)

4544 Palmer St., Chicago, Ill.





Thirty-four 10 H. P. and seventy-four 15 H. P. Link-Belt Silent Chain Drives operating twisters, Winnsboro Mills, Winnsboro, S. C., Lockwood, Greene & Co., Engineers.



838

THE Winnsboro Mills, Winnsboro, S. C., use Link-Belt Silent Chain Drives throughout all departments. Practically all equipment is individually driven with Link-Belt Silent Chain Drives—drawing frames, spinning frames, twisters, respoolers, spoolers, warpers, condensors, cards and fans. A total of over 250 Link-Belt Silent Chain Drives are used.

Note the clear overhead, good lighting, and compact, neat arrangement.

Link-Belt Silent Chain is the "Ideal Drive for Textile Machinery" and we will welcome the opportunity of proving it to you in your own mill, under your own conditions.

Send for Book No. 425

LINK-BELT COMPANY

PHILADELPHIA CHICAGO INDIANAPOLIS

BOSTON, 49 Federal St.

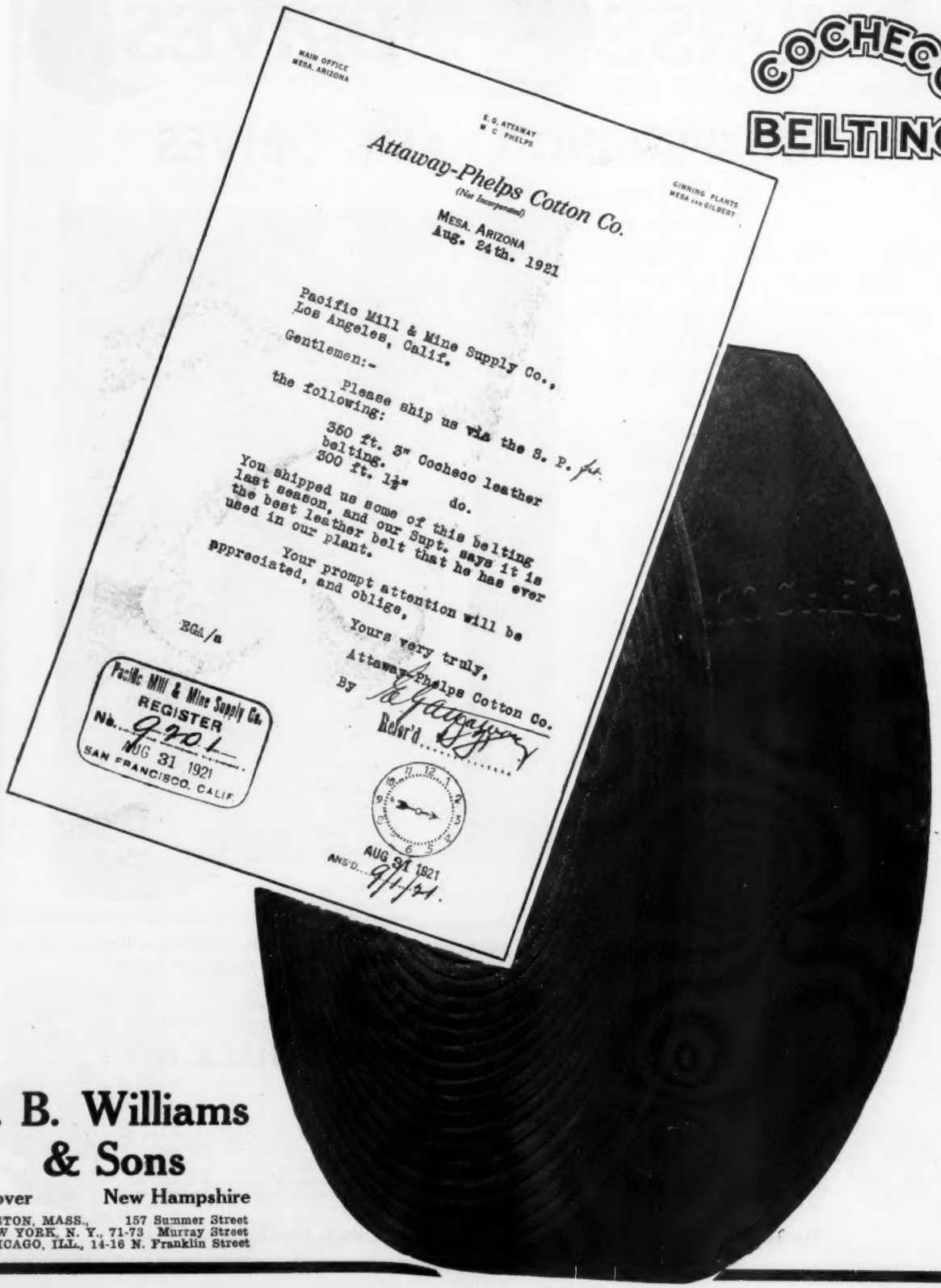
BIRMINGHAM, ALA., S. L. Morrow, 720 Brown-Marx Bldg.

CHARLOTTE, N. C., J. S. Cothran, Com'l. Bank Bldg.

LINK-BELT
SILENT CHAIN DRIVES

"—our Superintendent says it is the best leather belt that he has ever used—"

COCHECO BELTING



I. B. Williams & Sons

Dover New Hampshire

BOSTON, MASS., 157 Summer Street
NEW YORK, N. Y., 71-73 Murray Street
CHICAGO, ILL., 14-16 N. Franklin Street

THE ROCKER JOINT SILENT CHAIN WITH CENTER GUIDE LINKS

MORSE SILENT CHAIN DRIVES

THE MORSE "ROCKER JOINT"

ON SPINNING FRAME DRIVES

RUN COOL, OIL BATHS NOT REQUIRED

SMOOTH RUNNING IMPROVING QUALITY

ANY REDUCTION IN SPEED IS POSSIBLE

FREEDOM FROM OVERHEAD CONSTRUCTION

GUIDE LINKS HOLD CHAIN ON LINE

UNIFORM SPEED INCREASING PRODUCTION

CLEANLINESS — CONGENIAL WORKING SURROUNDINGS

WITHOUT SLIP

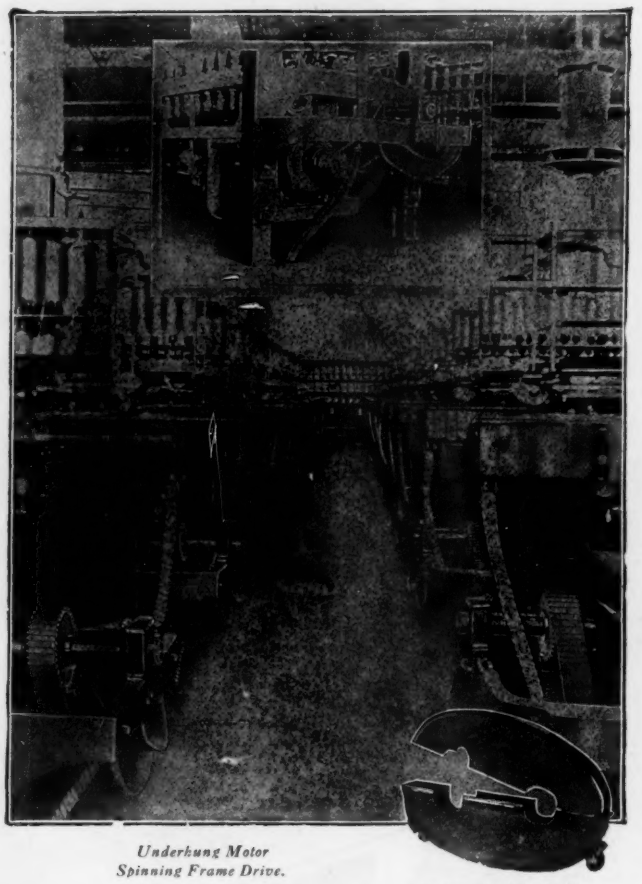
DURABLE

POSITIVE SPEED RATIOS

OPERATES QUIETLY

BETTER LIGHTING

BETTER PLANT LAYOUT



Underhung Motor Spinning Frame Drive.

Drawn Steel Chain Case

SAVE Construction, Space, Light, Fuel, Producing More With Less. Engineers Planning Power Transmissions Secure Data and Estimates of "MORSE" Drives.

Write Today for Booklet

Visit Booth 611—Eighth National Exposition of Chemical Industries—Grand Central Palace, New York, September 11th to 16th.

MORSE CHAIN CO., LARGEST MANUFACTURERS OF SILENT CHAINS IN THE WORLD **ITHACA, N. Y.**

Morse Engineering Service. Benefit by Morse Service as others do. Assistance Without Obligation.

Address Nearest Office

ATLANTA, GA.....702 Candler Bldg., Earl F. Scott & Co.
BALTIFORE, MD.....1402 Lexington Bldg.
BOSTON, MASS.....141 Milk St.
CHARLOTTE, N. C.....404 Commercial Bank Bldg.
CHICAGO, ILL.....Merchants L. & T. Bldg.
CLEVELAND, OHIO.....Engineers Bdg.
DETROIT, MICH.....1361 Abbott Street
KANSAS CITY, MO.....Finance Bdg., Morse Eng'rg Co.
NEW YORK CITY.....30 Church Street
PHILADELPHIA, PA.....Fuller Bldg.
MINNEAPOLIS, MINN.....So. 3rd St., Strong-Scott Mfg. Co.
PITTSBURGH, PA.....Westinghouse Bldg.
SAN FRANCISCO, CAL.....Monadnock Bldg.
ST. LOUIS, MO.....Chemical Bldg., Morse Eng'rg Co.
MONTREAL.....St. Nicholas Bldg., Jones & Glassco Reg'd
TORONTO...Bank of Hamilton Bldg., Jones & Glassco Reg'd
WINNIPEG, MAN.....Dufferin St., Strong-Scott Mfg. Co.

"Morse" is the Guarantee Always Behind the Efficiency, Durability and Service

50 or 60 or 70

How many Spindles can you operate EFFICIENTLY Per Horse Power?

One Horse Power is supposed to drive from 62 to 68 spindles, but to get this number it is essential that spindles be lubricated with an oil especially prepared for the purpose. It must be limpid and free-flowing. It must, however, possess sufficient viscosity to form a protective film of lubricant between the bolster and the spindle.

Such an oil is:

Texaco Rabtex Spindle Oil

This is a light-bodied, straight mineral oil. It is the result of long experimentation and represents the finest oil for the lubrication of Rabbeth and Ring Spindles in Textile Mills.

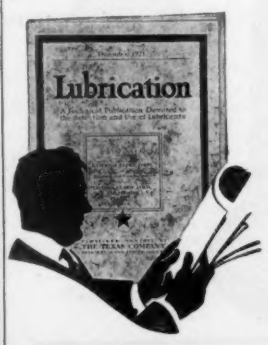
The use of Texaco Rabtex Spindle Oil makes possible the efficient operation of the greatest number of spindles per horse power, which means it reduces the power necessary to drive the spinning frame.

Texaco Rabtex Spindle Oil is endorsed by the Mills using it as the most wonderful spindle oil ever produced.

Other Texaco Specialties for Textile Mills are:

Texaco Comb Box Lubricant
Texaco Top Roll Lubricant
Texaco Loom Oil
Texaco Machine Oils
Texaco Turbine Oils
Texaco Engine Oils
Texaco Gear Lubricants
Texaco Greases

Free Subscription Blank



THE TEXAS COMPANY

Texaco Petroleum Products

Dept. O, 17 Battery Place, New York City

Offices in Principal Cities

This coupon, when filled out and mailed to us, entitles you to a FREE subscription to our magazine, "Lubrication." Published monthly by us and devoted exclusively to the scientific selection and use of lubricants.

Name _____

Street _____

City _____ State _____

7-22

Bowser Products
For Handling Gasoline and Oils Wherever Sold or Used

Filling Station Pumps and Tanks for Gasoline.
Portable Tanks for Gasoline and Oil.
Storage and Measuring Outfits for Paint Oils, Kerosene and Lubricating Oils.
Carload Oil Storage Tanks.
Power Pumps.
Dry Cleaners' Underground Naptha Clarifying Systems.
Richardson-Phenix Oil Circulating and Filtering Systems and Force Feed Lubricators.

Write for Booklets

Keep Production at Top Speed

Efficient production demands elimination of lost time. By making your gasoline supply easily accessible, at every needed point, Bowser Piston-Type Measuring Pumps save workmen's steps and time.

The long-distance pump delivers gasoline where it is to be used and measures it in the exact amount required, without spillage or waste.

The patented Bowser centrifugal separator assures clean, power-full gasoline, free from all moisture and sediment. The double cog rack assures easy operation.

Bowser equipment provides large underground facilities, enabling you to buy gasoline at quantity prices, eliminating the fire hazard and assuring minimum insurance rates.

To save money and speed up production, write for Illustrated Booklet A-45.

S. F. Bowser & Co., Inc.

Pioneer Manufacturers of Self-Measuring Pumps

Home Plant: Fort Wayne, Indiana
Canadian Plant: Toronto, Ontario

Factories and Warehouses:
Albany, Dallas, Milwaukee, San Francisco, Sydney

District and Sales Offices:
Albany, Atlanta, Baltimore, Boston, Buffalo, Chicago, Cleveland, Columbus, Dallas, Denver, Detroit, Kansas City, Los Angeles, Minneapolis, New York, Oklahoma City, Philadelphia, Pittsburgh, Portland, St. Louis, San Francisco, Toronto, Washington,
Representatives Everywhere.

Branch Offices, with Service Departments, in Principal Cities in this Country and Abroad

BOWSER ESTABLISHED 1885

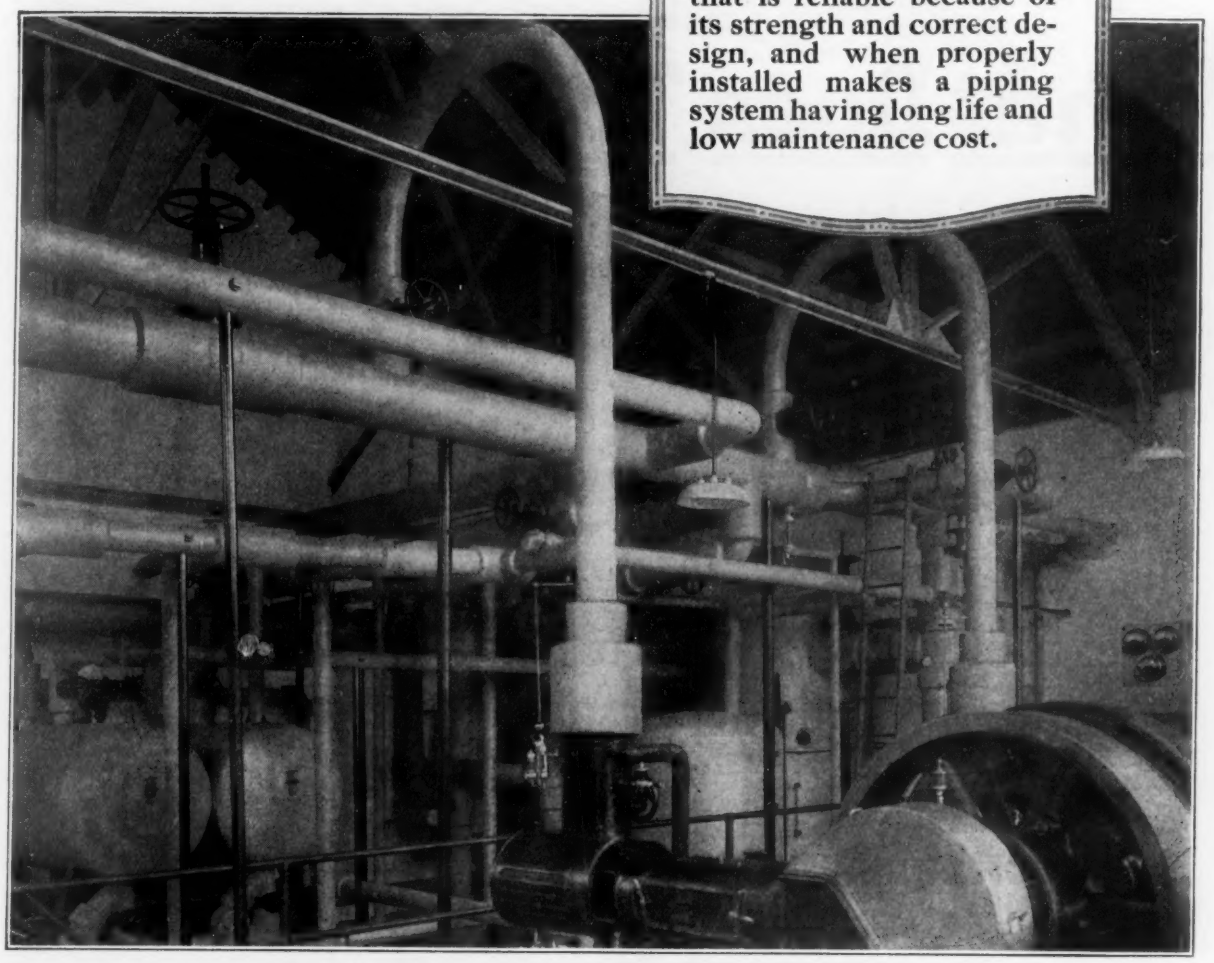
ACCURATE MEASURING PUMPS

OPERATING EFFICIENCY can be economically maintained with the use of dependable valves, fittings and piping equipment.

CRANE

Power Plant Equipment

is constructed of material that is reliable because of its strength and correct design, and when properly installed makes a piping system having long life and low maintenance cost.



We are manufacturers of about 20,000 articles, including valves, pipe fittings and steam specialties, made of brass, iron, ferrosteel, cast steel and forged steel, in all sizes, for all pressures and all purposes and are distributors through the trade of pipe, heating and plumbing materials.

SALES OFFICES, WAREHOUSES AND SHOWROOMS:

BOSTON, SPRINGFIELD, HARTFORD, BRIDGEPORT, ROCHESTER, NEW YORK, HARLEM, ALBANY, BROOKLYN, PHILADELPHIA, READING, ATLANTIC CITY, NEWARK, CAMDEN, BALTIMORE, WASHINGTON, SYRACUSE, BUFFALO, SAVANNAH, ATLANTA, KNOXVILLE, BIRMINGHAM, MEMPHIS, LITTLE ROCK, MUSKOGEE, TULSA, OKLAHOMA CITY, WICHITA, ST. LOUIS, KANSAS CITY, TERRE HAUTE, CINCINNATI

FOUNDED BY R. T. CRANE, 1855

CRANE CO.

836 S. MICHIGAN AVE.

CHICAGO

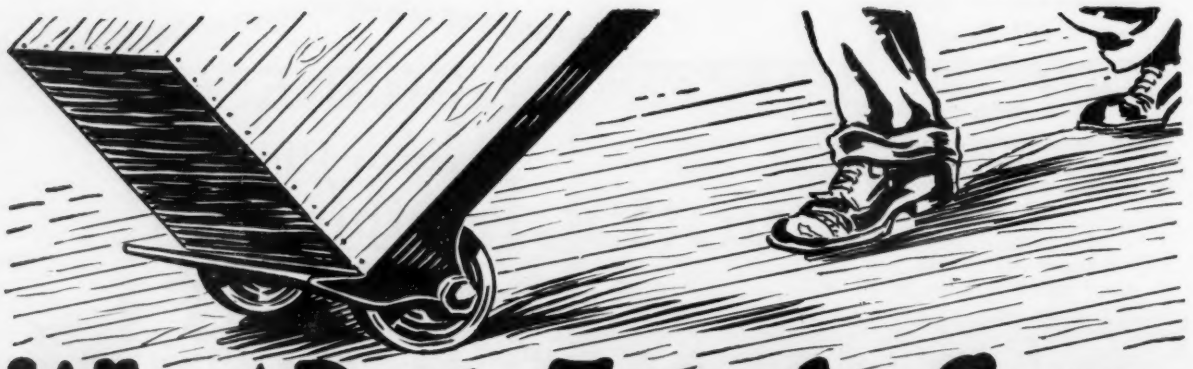
WORKS: CHICAGO AND BRIDGEPORT

INDIANAPOLIS, DETROIT, CHICAGO, ROCKFORD, OSHKOSH, GRAND RAPIDS, DAVENPORT, DES MOINES, OMAHA, SIOUX CITY, MANKATO, ST. PAUL, MINNEAPOLIS, WINONA, DULUTH, FARGO, WATERTOWN, ABERDEEN, GREAT FALLS, BILLINGS, SPOKANE, SEATTLE, TACOMA, PORTLAND, POCATELLO, SALT LAKE CITY, OGDEN, RENO, SACRAMENTO, OAKLAND, SAN FRANCISCO, LOS ANGELES

CRANE LIMITED — MONTREAL, TORONTO, VANCOUVER, WINNIPEG, CALGARY, REGINA, HALIFAX, OTTAWA.

CRANE-BENNETT, LTD. — LONDON, ENG.

You are cordially invited when in Atlantic City to make the Crane Exhibit Rooms (1105-1107 Boardwalk) your headquarters. We will be glad to receive any mail addressed to you in our care.



What Does Tupelo Care-

for the hard knocks which heavy loads and heavy shoes impose on a "Tupelo" floor? "'Nary a care!"

For "Heavy Going"

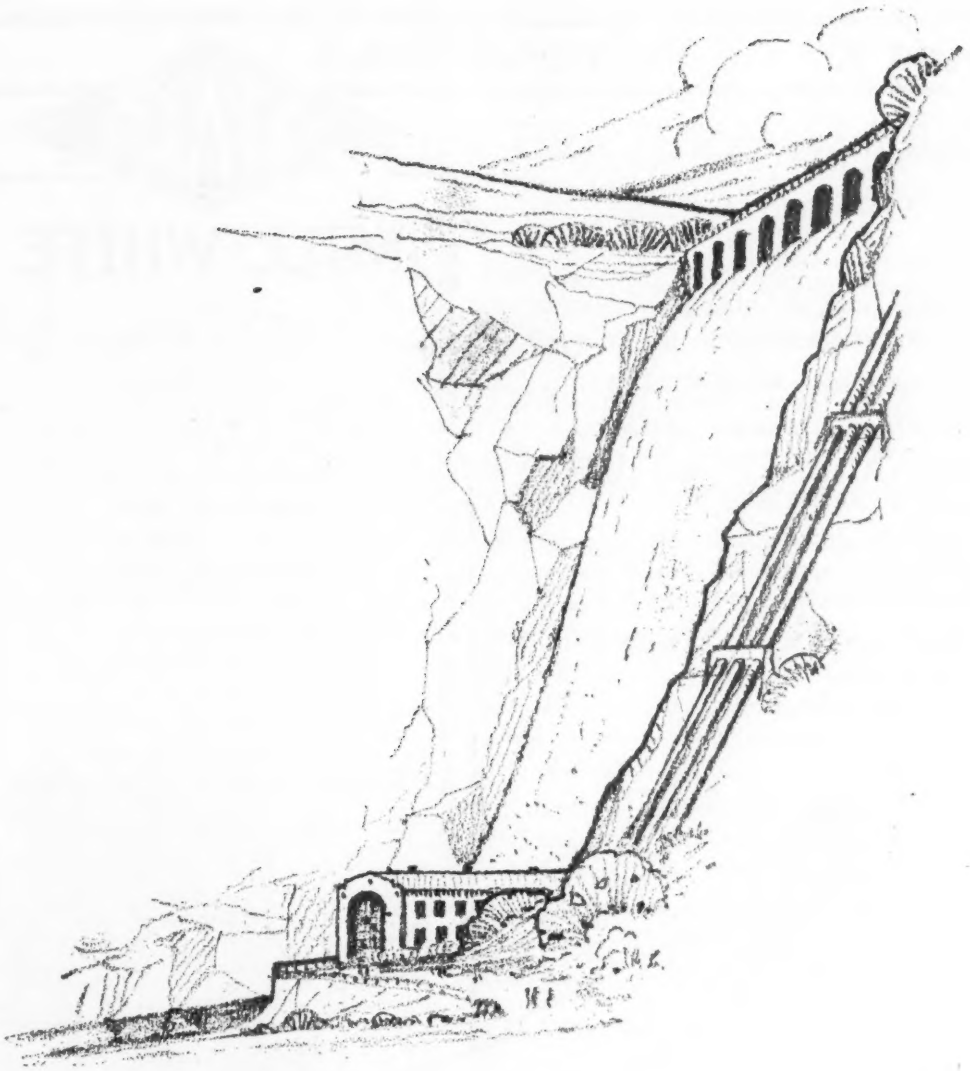
"a-wheel" or "a-foot," Tupelo floors in Textile Mills, Factories and Warehouses seem to actually grow solider and smoother as they grow older. Nature has supplied

TUPELO, the "Hard-Wear" Lumber

with a closely "knitted" or involved grain, which accounts for its non-slivering, non-splintering and long-wear characteristics.

For *all* the Tupelo facts—please write—*and you can't lay a floor quite* right *until you do.*

SOUTHERN CYPRESS MANUFACTURERS' ASSOCIATION
805 Poydras Building, New Orleans, La., or 805 Graham Building, Jacksonville, Florida.



POWER

THE ELECTRIFICATION OF TEXTILE MILLS IN THE SOUTH PRESENTS ITSELF AS THE BIGGEST FIELD FOR THE CONSERVATION OF POWER AND THE LOWERING OF OPERATING COSTS.

HYDRO-ELECTRIC POWER, IN ITS ELIMINATION OF FUEL and LABOR COSTS, HAS NO EQUAL AS AN ECONOMICAL SOURCE OF ENERGY.

ROBERT AND COMPANY

ARCHITECTS AND ENGINEERS

ATLANTA, GEORGIA

Paints *for* All Industrial Needs

Makes Light Reflectors of Walls and Ceilings

YOU CAN transform the walls and ceilings of your mill into mammoth reflectors that will distribute an even flood of light into the darkest corners.

All that's necessary to bring about this result is to apply two or three coats of OJACO Mill White to walls and ceilings. Every ray of light that touches the surface will then be effectively and gently diffused without the slightest glare.

OJACO Mill White will quickly save its cost by reducing your lighting bills and increasing the productiveness of your workers.

OLIVER JOHNSON & CO., INC.
Paint Makers
PROVIDENCE, R. I.

OJACO TRADE MARK

MILL·WHITE

ATLANTA, GA.
Cowles & Bleckley

BOSTON, MASS.
Lewis E. Tracy Co.

CHARLOTTE, N. C.
Charlotte Supply Co.

FALL RIVER MASS.
Wm. F. Harticon

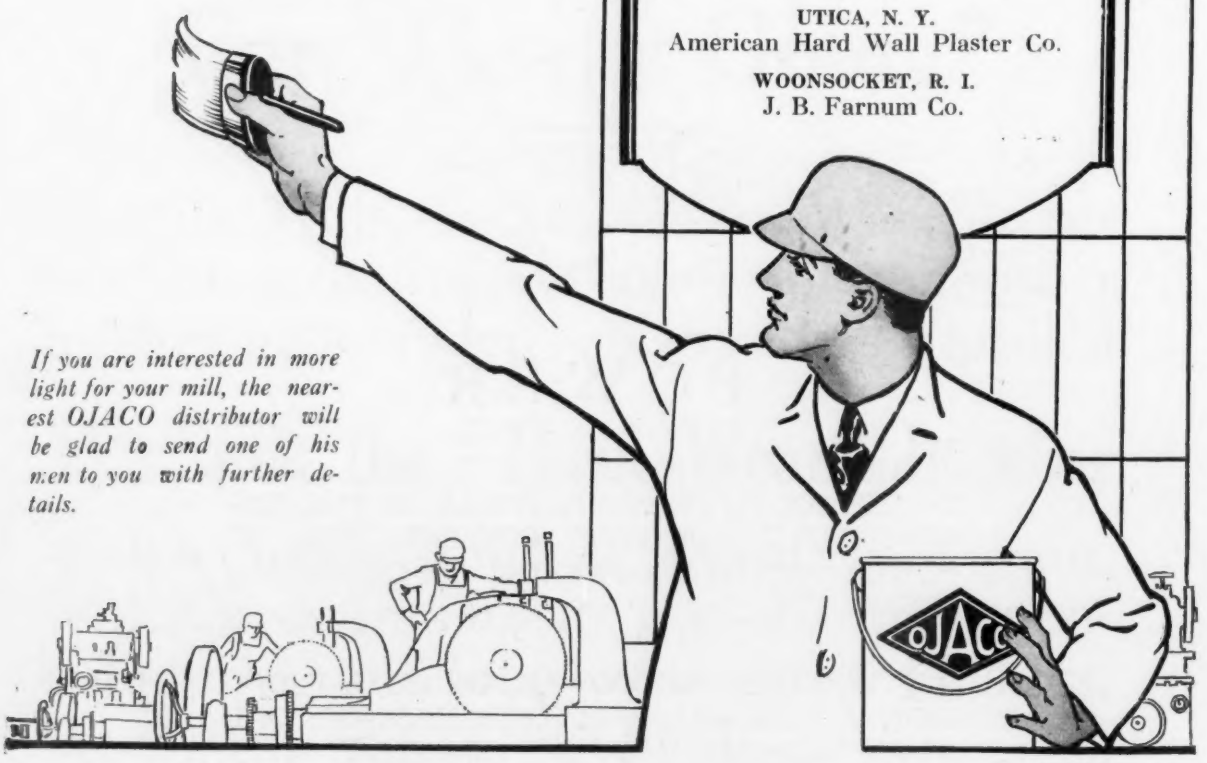
FITCHBURG, MASS.
B. A. Cook Co.

ROCHESTER, N. Y.
F. P. Van Hosen Co.

SYRACUSE, N. Y.
Alexander Grant's Sons & Co.

UTICA, N. Y.
American Hard Wall Plaster Co.

WOONSOCKET, R. I.
J. B. Farnum Co.



If you are interested in more light for your mill, the nearest OJACO distributor will be glad to send one of his men to you with further details.

THE FUNCTIONS OF THE ENGINEER

To Lead Industry Into Better Methods

THE margin between profit and loss is determined not so much by major as by minor factors in the complex processes of modern manufacture.

The major losses in process or operation are self-evident, but the minor ones are frequently not found without exhaustive study and long experience.

Improvements in a few small details will frequently make a dividend possible where none has been earned previously or will increase prior returns by a surprising margin.

An always important asset to the manufacturer is the service of the Engineer. His contact with a wide diversity of problems makes his assistance more valuable.

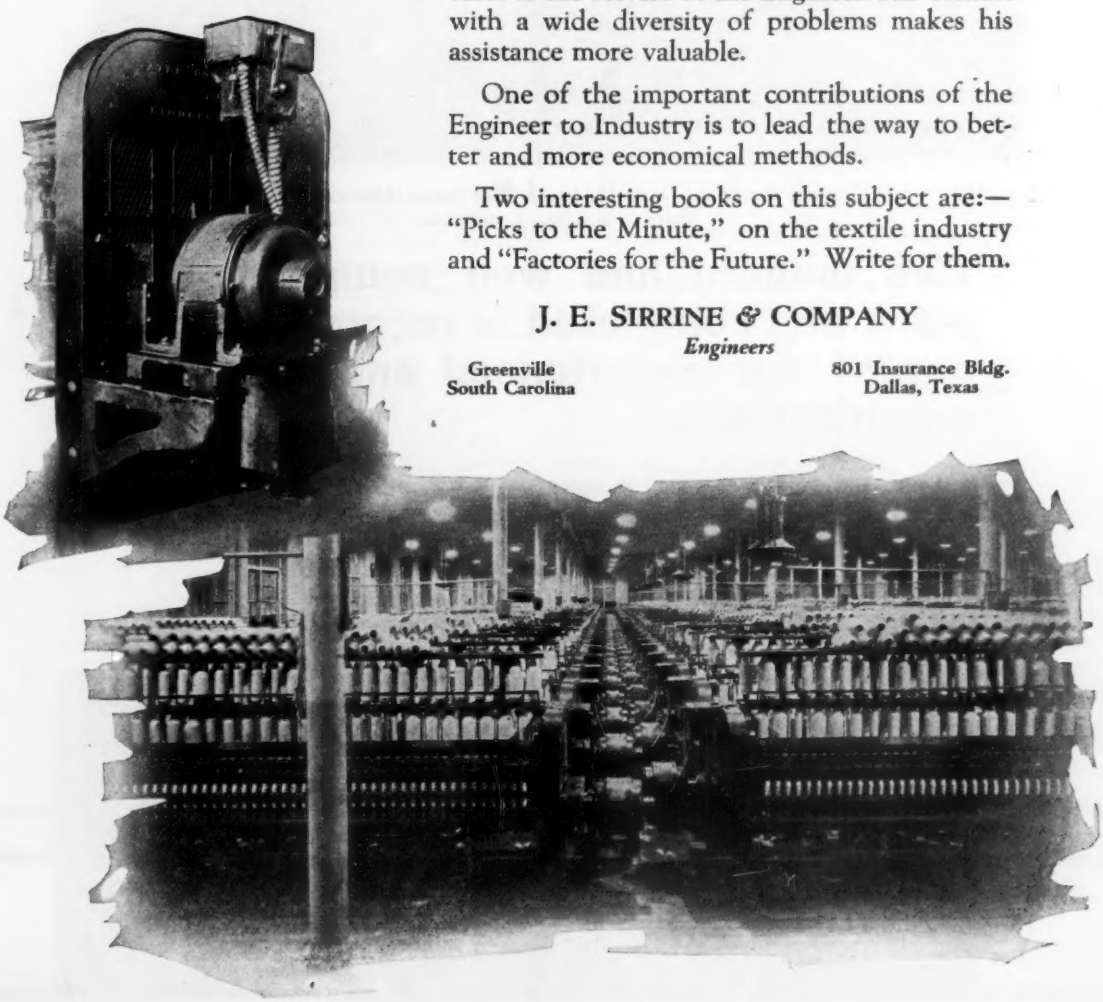
One of the important contributions of the Engineer to Industry is to lead the way to better and more economical methods.

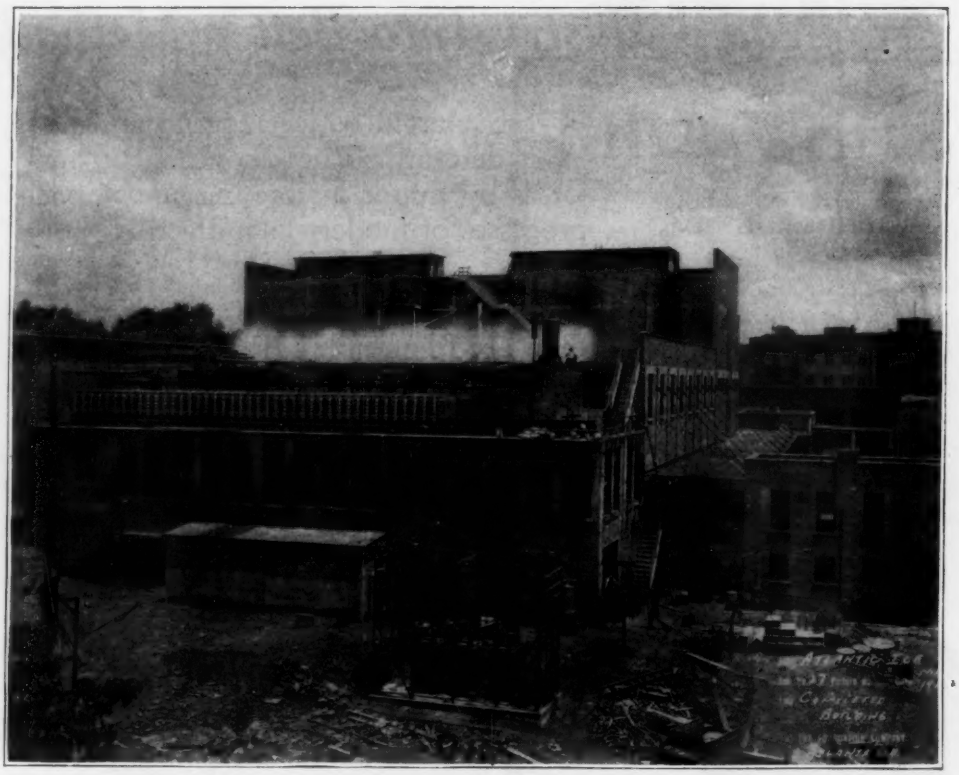
Two interesting books on this subject are:—"Picks to the Minute," on the textile industry and "Factories for the Future." Write for them.

J. E. SIRRINE & COMPANY
Engineers

Greenville
South Carolina

801 Insurance Bldg.
Dallas, Texas





West End Plant---Atlantic Ice & Coal Corp., Atlanta, Ga.
Morgan & Dillon Architects.

This modern and well equipped Ice plant was completed in record time by one of our experienced and efficient organizations.

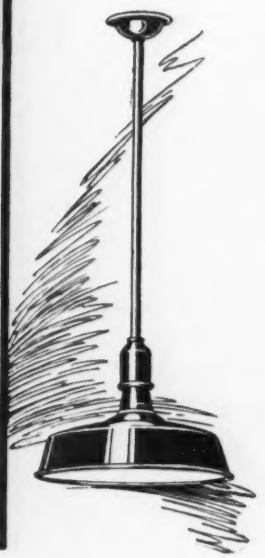
THE FOUNDATION COMPANY

CONTRACTORS AND ENGINEERS

ATLANTA

NEW YORK	SAN FRANCISCO	MONTREAL, CANADA
NEW ORLEANS	LOS ANGELES	PARIS, FRANCE
CHICAGO	PHOENIX	LIMA, PERU
PITTSBURGH	PORTLAND, ORE.	HAVANA, CUBA
DETROIT	VANCOUVER, B. C.	TAMPICO, MEXICO

BUILDERS OF **SUPERSTRUCTURES** AS WELL AS **SUBSTRUCTURES**



Photograph of a card room in a southern cotton mill, equipped with IVANHOE RLM reflectors and bowl-enameled MAZDA lamps.

Time to Revamp Your Lighting

Be ready when your rush season comes. Revamp your lighting now, remembering that good textile mill lighting is an investment that pays dividends every working day.

Go over your plant lighting from card room to cloth room. Take foot-candle meter readings to be sure that you have enough light for every operation. Where the light is inadequate install more IVANHOE RLM reflectors and bowl-enameled MAZDA lamps. These reflectors direct the light on the work where you want it and give you value received for every dollar spent for current. Lastly be sure that you have no bare lamps and that every lighting unit is thoroughly clean.

As you inspect your lighting, remember that good lighting in textile mills increases production, betters employee morale, enables workmen to see machines running idle, decreases spoilage —often as much as 50%, makes possible proper sanitation, and prevents many minor accidents. Mill executives in every textile center have demonstrated to their **own** satisfaction and in their **own** plants that adequate lighting does these things.

Is **your** lighting the most profitable investment it can be made? Near you is an IVANHOE distributor who will gladly advise you without obligation on your part. See him at once, or write to us direct.

IVANHOE-REGENT WORKS of General Electric Co.
Cleveland, Ohio

"Ivanhoe" Steel Reflectors Lighting Glassware, Anderson Self-Adjusting Arms, and Illuminating Service.

"SERVICE TO LAMPS"

IVANHOE

GLASS SHADES - STEEL REFLECTORS

Why Grinnell Textile Dryers Save Time and Money

Three distinct factors contribute to the unequalled efficiency and operating economy of the new line of Grinnell Textile Dryers—

1. The Right Drying Principle

A large volume of only moderately heated air, passing through the drying compartment with a slow, spiral movement—that is the fundamental operating principle of the new Grinnell Dryers.

2. Superior Mechanical Construction

In the development of the Grinnell Textile Dryer, we realized that the right drying principle was not enough—that right mechanical construction was equally essential to efficient operation and inexpensive maintenance. For this reason, every part of these machines is made with the utmost care and precision. And the housing, being of panel construction, permits the easy installation of additional units.

3. 70 Years of Experience

This company is the oldest heating concern in America. Only our intimate knowledge of heating problems, gained through 70 years of experience, made it possible for us to embody so successfully the right drying principle into a thoroughly practical machine—a machine that does its work well and quickly, and that will last for many years with little or no maintenance expense.

Illustrated descriptive booklet will gladly be sent on request. Or, better still, why not let our Engineers explain to you personally how Grinnell Dryers will save you both time and money? Address Grinnell Company, Inc., 266 West Exchange Street, Providence, R. I.

GRINNELL
TEXTILE DRYERS

AUTOMATIC YARN DRYERS
For drying Cotton and Wool Yarn in Skeins.

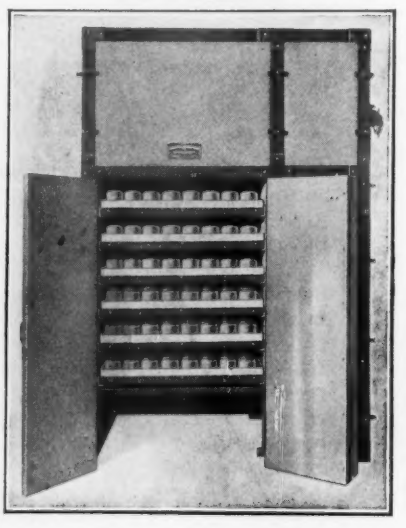
AUTOMATIC STOCK DRYERS
For drying Cotton Wool, Hair or Noils.
Carbonizing Dryers for Noils and Rag.

AUTOMATIC LOOPING DRYERS
For drying Cotton Piece Goods, Plush, Carpet, Toweling and Underwear.

PACKAGE TAPE DRYER
Especially designed for drying yarns dyed by the Franklin Process.

TRUCK YARN DRYERS
For drying Cotton and Wool Yarn in Skeins.

COMPLETE AUTOMATIC CARBONIZING SYSTEMS FOR CLOTH
Drying Systems applied to Tentering Frames.



This dryer, especially constructed for drying yarns that have been dyed by the Franklin Process, contains the strength and rigidity that have always been features of other Grinnell Textile Dryers.

Selling Agents for Southern States:
G. G. SLAUGHTER MACHINERY CO.
Greenville, S. C.

GRINNELL COMPANY

Automatic Sprinkler Systems | Steam & Hot Water Heating Equipment | Humidifying and Drying Equipment | Fittings, Hangers and Valves | Pipe Bending, Welding, etc. | Power and Process Piping

If it's Drying, take it up with us

COTTON

Published Monthly by

W. R. C. Smith Publishing Co., Dalton and Atlanta, Ga.

L. L. ARNOLD, Editor. **R. W. PHILIP, Associate Editor.**

Editorial and Advertising Departments, Grant Building, Atlanta, Ga. Subscription price, $1.00 per year; Canada, $1.50 a year; Foreign, $2.00 a year. Entered at the Dalton, Ga., postoffice as second-class matter.

Contributions to the columns of Cotton are solicited and paid for after publication. The name of contributors need not necessarily be used, but must accompany all manuscripts.

Orders for any change in advertising must reach Atlanta previous to the tenth of the month preceding month of issue, otherwise publishers cannot be responsible for changes.

When changing address, notify us, not the postmaster. Always give the old address as well as the new one.

Member Associated Business Papers, Inc.

Volume 86 **Member Audit Bureau of Circulation.** **No. 9**

CONTENTS

EDITORIAL—

The Requisite Qualities of the Overseer 665
The Value of Associations 666
An Investigation that Means Something 666
Commercial Standards Council Formed 667
Poor Old Gompers 667

GENERAL AND TECHNICAL—

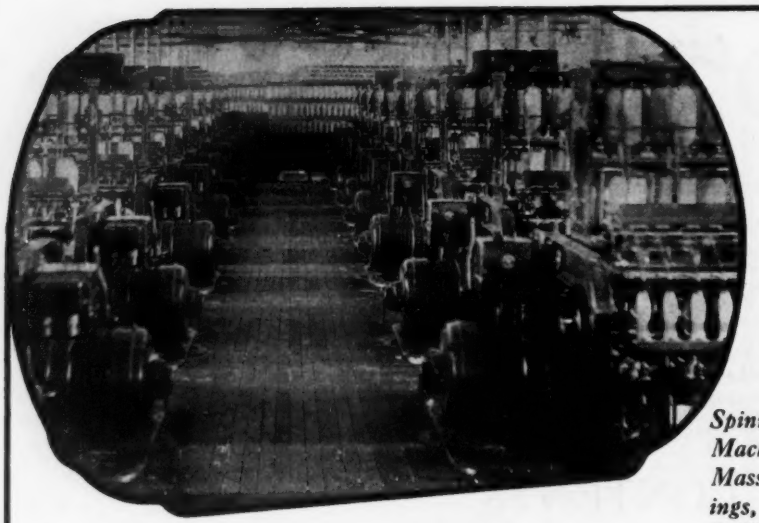
Southern Textile Association 668
Address of President Johnstone 668
The Human Side of Industry 670
Discussion on Cloth Tolerance and Defects 671
Opening, Mixing and Picking Discussion 676
Report of Spinners' Committee 678
"Thirsty Cotton"—A Moving Picture 680
Report of General Chairman on Sectional Committee Work 683
Character Building as an Essential to Success 686
Popular Textile Chemistry 691
Vertical Openers in Triple Tandem 693
Synthetic Indigo 695
What the Southern Mills are Doing 698
The New England Mill Situation 700
Cotton Comment 702
Notes About Men You Know 704
The Use of Scheduled Costs 706
An Old-Timer Says— 707

HOW OTHER MEN MANAGE—

Some Points for Comber Men 709
An Opinion on Tandem Creightons 709
Losses Through Waste in the Mill 711
Prefers Grid Bars to Screens 713
Variations in Twist 713
Systematizing Repair Parts 713
Classifying Defects in Cotton Cloth 717
Bobbin-Lead Versus Flyer-Lead 719
What Causes Uneven Yarn? 723
Making a Gain in Efficiency 725
That Chinese Mill Problem 728
The Employment Manager 731

KNITTING SECTION—

With the Knitters at Signal Mountain 735
Latch Needle Circular Ribbers 739
Progress of the Knitting Industry 744
The Knit Goods Market 747
The Yarn Market 753
Among the Knitting Mills 753



Spinning frames manufactured by Mason Machine Works Company, Taunton, Mass., equipped with Hyatt roller bearings, in operation at the Narragansett Mills, Fall River, Mass.

Good Spinning Frames
Plus Hyatt Roller Bearings
Become *Better* Spinning Frames

The Mason Machine Works Company of Taunton, Mass., determined to make their spinning frames of maximum value to the mills, have prepared to equip their frames with Hyatt roller bearings. After careful and thorough consideration, they recommend the Hyatt bearing as the logical spinning frame bearing.

The words "Hyatt equipped" on your spinning frame specifications mean:

Power saving—approximately 11% (actual tests).
Reduction of lubrication costs—about 90%.
Exceptional bearing durability.
Minimized maintenance costs—oiling five times a year is all the attention they require.

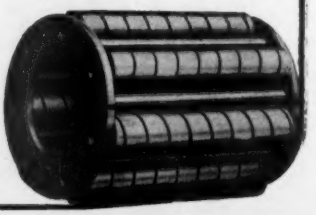
For your new spinning frames why not profit by the advantages of Hyatt roller bearings and the action taken by this long established builder of spinning frames?

The same advantages can be secured by having these bearings applied to the frames you now have in service. Write us or the frame builder for further information.

Hyatt Roller Bearing Company, New York, N. Y.

Industrial Bearings Division, New York
Motor Bearings Division, Detroit
Tractor Bearings Division, Chicago
Pacific Coast Division, San Francisco

USE HYATT BEARINGS ON YOUR LINE SHAFTS TOO BULLETIN 157



With The Publishers—

Some Toots and a Promise

At the Knitting Arts Exhibition in Philadelphia, Dr. E. W. France, the head of the Philadelphia Textile School and the Dean of textile instructors in America, remarked to an acquaintance, "COTTON is a good paper. It has improved wonderfully in the last four or five years. I hear it talked about, and no paper creates much talk unless it's going ahead."

The Superintendent of a large southern colored goods mill writes to renew his subscription and adds, "I want to take this opportunity to say that I think COTTON the best textile magazine that I know of and that I would not be without it."

The former General Manager of a group of southern mills, who removed to another section of the country, writes, "I hasten to renew my subscription to COTTON. Its pages contain many gold nuggets for the manufacturer, and no overseer or superintendent can read it without becoming more proficient."

An Overseer in a New England mill, writing to renew his subscription to COTTON, adds, "May I say that I have found it one of the best textile publications that I have ever read? I congratulate you."

A New Bedford, Mass., cotton mill writes under date of June 10th, "We have not yet received our copy of the June issue of COTTON. Will you kindly investigate as we are following this paper very closely?"

"The Southern Agent of a large textile machinery concern writes to renew his subscription to COTTON and advises further, "We have long since learned that your publication is a very valuable journal and we look over each issue with interest as it arrives."

The Proprietor of several commercial roller covering shops writes, renewing his subscription, and says, "I had best do without one meal a day than do without COTTON, because it is both instructive and beneficial."

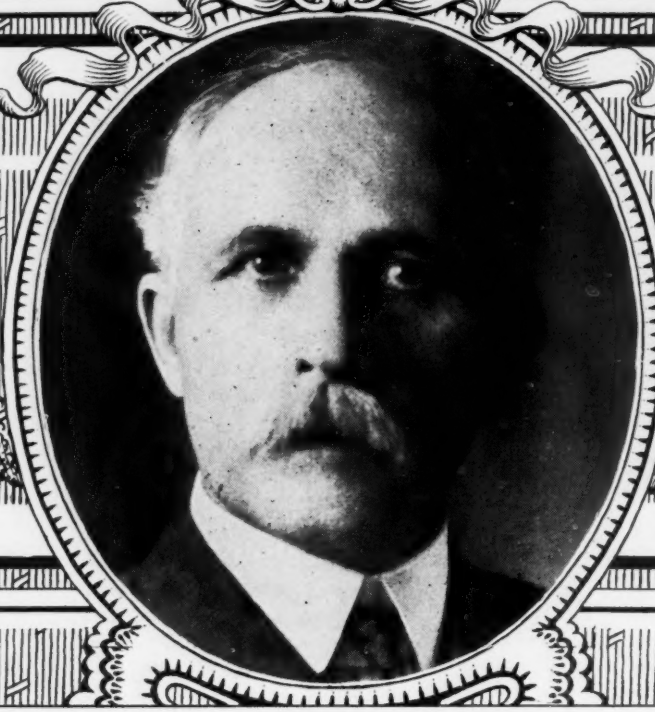
"The Vice-President of the third largest group of hosiery mills in the country writes, "I think COTTON is one of the best publications of all the technical journals and I always enjoy reading my copy."

The Agent of a New England mill, in writing to compliment us on the "mighty good reading and practical ideas which we find in the columns of COTTON," further points out that "I feel very strongly that a weekly publication is not a thing for a busy cotton manufacturer, but a monthly edition is much better and more thoroughly looked over."

A man at the Wildman exhibit at the Philadelphia show remarked that "COTTON'S monthly review of the knit goods market is the most complete and satisfactory that I can find." He added that he takes it home and reads it every month.

Like all editors, ours are sometimes grouchy, but they are usually truthful, therefore after we compiled the foregoing "toots," we went to the editorial department to see what they had lined up for future issues. They promise that COTTON is to be better than ever, in fact, we found them so optimistic over articles they have scheduled for the coming year that we returned to our desk prepared to tie the whistle down the next time it is our turn to go to bat and say something on this page.

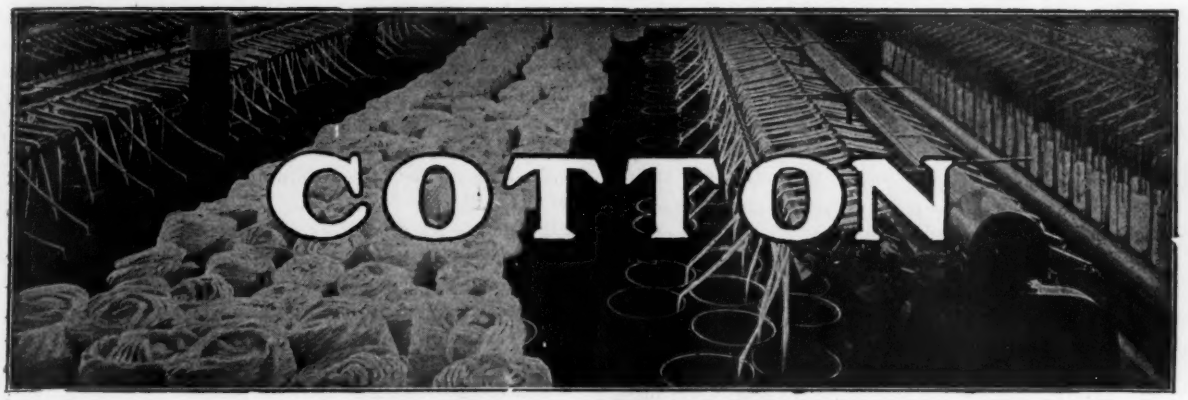
AMONG COTTON'S READERS



John H. Quinlan
Vice-President and General Manager
Cedartown Cotton & Export Company
Cedartown, Georgia

"I have been a subscriber to COTTON and other textile publications for many years, and I consider the articles published in COTTON superior to others, from a practical standpoint."

J. H. Quinlan



July, Nineteen-Twenty-Two

The Requisite Qualities of the Overseer.

Seventy-five per cent of a mill's success depends on its force of overseers. No matter how carefully the management may lay the plans, the final execution of those plans devolves upon the resources and executive ability of the overseer to produce the results and attain the aims in view. He is, therefore, an important factor and should be selected with the greatest judgment.

It is all well enough to want and to look for "hands" with all kinds of desirable qualifications; but what about the overseer, the boss himself, high or low? It is not fair to blame all the friction and shortcomings on the mill operatives unless the boss is qualified by nature and by training to do his part. There are at least six qualities he needs about as badly as a house needs a roof, in order to make good.

The overseer, or boss, whether tall or short, portly or slim, young or old, should keep himself in good physical health so that he can maintain a good mental attitude under fatigue, provocation or fair sailing. If he is wise he can and will control the health of his body and the condition of his mind, and be a real man—a whole man, fit to lead—strong enough to govern himself and therefore able to govern others. He need not carry a silly grin and he must not carry a sour frown; he need not cut up funny capers and he must not stand over his help like grim death; he need not do any small talk and he must not talk like a consuming tyrant. The sober, earnest, kind face attracts attention in the crowd, while the finicky, sour, dyspeptic visage paralyzes all animation. The even, resolute, manly voice is heard in good cheer, while a voice full of virulence and buzz-saws curdles all good feeling into pain and resentment. So finally there are two kinds of overseers: the good overseer, who gets results, product, cooperation, and harmony; and the misfit overeer who will demoralize the best industrial crowd going, and lose money for the mill.

An overseer should be a man of thorough experience over the range of work he assumes to manage, then the element he contributes to the product is right. A road is no better than its worst spot, for loads must be gauged with that spot in view. A chain is no stronger than its weakest link, for if it breaks it will be at that link. A product is no more perfect than the defect in the course of its manufacture. The overseer should *know* or stand aside and learn something.

An overseer should be a master judge of people, so he can employ wisely and direct skillfully. This is the rarest qualification of the overseer and is so composite in its nature that it affects the entire mill interests in the way of smooth running, production, and the ultimate success of the company. This is sometimes called "human nature," but human nature is not so hard to know, for it is uniformly the same in all people and its predominating characteristic is undiluted selfishness. It is the difference in mental cast that is hard to know, for it is based on the four well recognized mental temperaments, viz., sanguine, phlegmatic, choleric, and melancholic. These are plain enough to one who knows and a knowledge of them helps him to adapt people to different kinds of work. It is in fact a natural gift with some people to be able to size up other folks with one good square look, just like some men can look at an ox and tell his weight remarkably near. Some can neither judge folks, nor guess weights, nor distances, nor even shoot straight—they have no gift in that way, nor can it be bought with money, nor with experience, nor with education—it is inborn. We know of an industrial plant that works 20,000 "hands" and utilizes one of those natural born judges as employment agent at a high salary. He runs applicants through a reasonable questionnaire, not so far-fetched as Edison's, and is thus aided in determining the trend of their mind and ability, and then he gives them jobs to suit, taking into consideration their physical strength and condition.

An overseer should have that powerful attribute called personal presence that neither takes the big-head nor is easily trampled upon. You have seen him—he just looks like a man who controls others. He is the leader of the crowd, the leader of the jury, the leader of the neighborhood, the leader of the army, the leader of any political convention, or the leader in any of the hundreds of human aggregations. Everybody looks to him to lead off in the right direction—just so is the successful overseer that is big enough to cover the whole case, and the mill makes good money on him, because he gets results. He looks neither mean nor ferocious—he just looks solid and doesn't talk his head off.

An overseer should be a good example of the qualities he wants in his operatives. "Actions speak louder than words." An overseer should obey every regulation in full. He is not above the laws of the mill any more than a jutsice of the United States Supreme Court is above the laws of the land. Obedience is the first law of heaven and ought

to be the first law of earth whether the crowd be large or consist of but one person. An overseer should be firm, right, just, honest, patient, sympathetic, accommodating, considerate, reasonable, polite, approachable, kind-hearted, but not soft-headed. All these amenities of the better life cut an immense figure in the smooth handling of the average crowd, and all are in line with the mill's best interests.

As a sixth and final requisite an overseer should be a high-toned man in principle and practice. A man of weak character is a burden anywhere you put him, but in the capacity of overseer is a colossal failure. Right thinking fathers and mothers who have sons and daughters in the mill, must be considered, for they must feel assured that the right influences and surroundings prevail, and when once they have doubts on that point the overseer is plainly in fault and the mill loses its good reputation in the community. With this in view, "poison oaks" should be weeded out the same day they bob up, and the crowd kept, as the Boy Scouts say, physically strong, mentally awake and morally straight.

The Value of Associations.

"In any industry, you will find the men with a bent toward associations and organizations the most progressive and most successful," said a prominent mill executive in conversation the other day.

The truth of this assertion is recognized generally by leaders of thought throughout the country, and certainly in the textile industry it has received as ample a demonstration as in any other line of endeavor. The several conventions held during the present summer, representing practically every branch and section of textile manufacturing enterprise, have gathered together in common council and fellowship those who represent the greater bulk of the forward moving spirit and energy in the respective divisions of the trade. The various assemblages have been representative of the men whose ideas and efforts have forwarded the progress of the industry and who have developed it to the position of prominence it now occupies in the world of commerce and trade.

And by the same token, the man who actively supports the association representing his division of the industry is himself aided and benefited through that connection. This is continually being proven in the associations of the executive heads of the plants, where the assistance of his organization has become a valuable asset to the mill president or treasurer in the daily conduct of his affairs, through the aid rendered in matters pertaining to cost methods, traffic problems and the like, and in securing fair and equitable legislation and in defeating that which is a hindrance, by the more effective presentation of his cause through the concerted efforts of all interests working toward a common goal.

Associations have proven no less a benefit and service for him who comes under the classification of the practical man, the superintendent, the overseer, who has in his charge the actual operation of the mill's property, who has vested in him the responsibility of the quality and quantity of product which will return to the investors a satisfactory guerdon on their substance, who has resting upon him, as no small part of his duty, the trust of the welfare and happiness of the great body of people who are under his immediate direction.

The opportunity afforded this man, the important pillar in the industrial structure, of meeting together with others engaged in similar activity, to discuss those things pertaining directly to the execution of his responsibilities, provides a means for better equipping him as a valuable asset to his mill, strengthening his knowledge and broadening his vision to the attainment of that end.

There is, among the other results of associations, one benefit and opportunity which perhaps should be considered equally with those discussed and one which applies in all divisions of the field—the opportunity for closer personal fellowship among the men, that actual association which comes when men meet on common ground, aspiring to the same purpose, the betterment of the industry for all. The doctrine that no man can live unto himself alone never had more appropriate application than in the present day of highly developed methods of industry and of far-reaching interdependence of man upon his fellowbeings. Associations, organizations, meetings, conventions, whatever designation is given to them, produce results—when a man can meet his neighbor, his friend, his co-worker—in the commercial application, his competitor—he never returns to his labors without a broader vision, a closer friendship, a better understanding; and seldom without the pleasing satisfaction that he has contributed something to the furtherance of his industry.

An Investigation That Means Something.

Business men, hunting for dependable facts having to do with their immediate problems, are not inclined to look with much favor on the products of Congressional hearings and investigations. All too often a hearing before a committee of Congress is no more than a bleating of nonsense by enthusiasts or partisans. Investigations generally are guided, by those who promote them, toward foreordained ends that deal more with politics than with truth.

Occasionally there is a genuine investigation. Such was true of the inquiry made into the question of public finance and currency by the Aldrich Monetary Commission fifteen years ago. Whatever may be said of the Commission's findings, or however may be disputed the question as to whether the inquiry led to any reforms that since may have been made, there is no argument about the worth of the data collected and published in a series of volumes as thick and almost as numerous as those on Dr. Elliot's five-foot shelf. It is, both quantitatively and qualitatively, the greatest and most authoritative collection of information having to do with the subject in point. Another similarly thorough inquiry into the immigration problem was made a dozen years ago—and, as so frequently happens, the lessons disclosed by the study were for long and still are largely ignored.

At the present time a Congressional committee is completing another investigation that merits the respect of all truth-loving men. Regardless of its findings, the committee's work will rank perhaps as the greatest single contribution to economic knowledge made since the war.

The committee is the joint one of House and Senate that has been looking into the agricultural situation with special reference to the recent farming crisis. Being the product

of the farm "bloc" and dominated by members of that new and perhaps questionable integument of Congressional power, many naturally expected its operations to flow along the empiric and propagandic lines of the average of such committees. But such truly has not been the case. In its recommendations some measure of bias toward agriculture may lead it somewhat astray from sound logic. But the data that have been scientifically assimilated and orientated by it should be of worth in directions far from those immediately aimed at.

The committee has made gigantic effort to get the facts wherein lie the truth and possibly the solutions for virtually all of our problems of national economics. It did not depend on hearings and evidently has paid little attention to what was disclosed in that manner. It has trusted almost solely to original researches conducted by trained experts. In seeking the facts about transportation, for example, it sent out not fewer than 10,000 questionnaires and from them received statistical information which involved the making of 25,000,000 calculations.

And the best commentary that can be made upon its findings, so far as they have been announced, is that they contain nothing that, in the news sense, is sensational, though much that is surprising and soundly enlightening.

It finds, for instance,—though the conclusion, for lack of available data, isn't put forth as a scientifically exact fact,—that of the average dollar paid by ultimate consumers for farm products the producer gets only 28 cents. But it makes no effort to show that the remainder goes into the pockets of persons who would selfishly oppress tillers of the soil. Quite the contrary, for Chairman Sydney Anderson takes pains to urge the public to differentiate between profit and margin; and also to show that all but a comparatively minute percentage of the balance goes for costs and not net earnings. Those costs, the committee finds, often are economically excessive. But this is not because of conspiracy to oppress the farmer or consumer, but due to factors inseparable from economic laws. Thus the committee finds that it now costs more to transport, sell and deliver products that originate on the farms than it does to both produce and manufacture those products. In fact, it finds that manufacturing costs do not take more than 10 to 17 cents out of the average consumer's dollar. There is nothing less sensational or sounder than the finding as set forth by Chairman Anderson, to wit: "Improvement in distributive processes with consequent reduction in costs cannot come as the result of legislation except as legislation may help to set in motion economic forces to that end."

Whether one agrees with all its conclusions, no man of affairs who wishes to be informed on the underlying currents of economics will fail to find the reports of the committee of big practical value. Two, one on "The Agricultural Crisis and its causes," and the other on "Credit" have been issued. Others on "Transportation" and "Distributing and Marketing" probably will be available by the time this is printed. Get them and read them; they may disclose to you much that you don't know about your own business, which in the nature of things cannot be unaffected by economic currents.

In the long run, a man hits what he aims at. Therefore, although he should fail immediately, he had better aim at something high.

Commercial Standards Council Formed.

An organization to be known as the Commercial Standards Council has recently been formed by a group of business men, who are, for the most part, executive officers in business associations of national importance. It is their aim to foster and maintain higher standards in business, and especially to eliminate what they term the corrupt and growing practice of commercial bribery.

On January 27 of this year there was introduced in the House a Judiciary Committee bill known as the "Commercial Bribery Bill," H. R. 10159, to "further protect interstate and foreign commerce against bribery and other corrupt practices." This bill passed the House without opposition and is now in the hands of the Interstate Commerce Committee of the Senate of which Albert B. Cummins, of Iowa, is chairman.

The passage of this Bill, which is receiving the active support of the Commercial Standards Council, will provide a punitive weapon that will unquestionably tend to eliminate such practices and aid in maintaining a much higher standard of business morality. It is entitled to the wholehearted and unceasing support of every business citizen who desires to work for and attain big, clean, constructive, American business principles throughout the commercial fabric of the nation.

Poor Old Gompers.

Ss-h-h-h! 'Tis the somnolence of age. For many years he has on bended knee acclaimed unionism as king and preached the doctrine that union labor could do no wrong. Therefore, it was but consistent for the President of the American Federation of Labor, while appearing as a witness before the Lockwood Housing Committee of New York, to dramatically exclaim, "God save labor from the courts!," when this means was suggested for correcting some of the abuses that are well known to everyone and even admitted by Mr. Gompers.

It would take too much space to list here all the charges of abuses and unlawful practices placed against the unions by the evidence presented before the Lockwood Committee, and in other similar investigative tribunals. Moreover, it is useless because it is already so well known. Such operations are too continuous and too general to be easily forgotten. On the other hand, remote instances of judicial punishment, as in the case of the McNamaras of the steel workers, soon become a clouded and misty memory in the public mind. That Mr. Gompers has overlooked no instance of judicial wrath in arranging *his* memory files is evident from the emphatic statement quoted.

Public sentiment has already strongly condemned organized labor for the arbitrary and self-seeking actions so evident during the past few years. The multitude has seen that the greater public good has frequently been wantonly sacrificed for the obvious benefit of the selfish few. And yet Gompers, admittedly sane, conservative, and even old fashioned in his outlook on such matters when compared with some of his aspiring assistants, admits abuses, admits the unions cannot check them, but still protests against any intervention by the courts.

No man is happy who does not think himself so.

Southern Textile Association

(This article is specifically copyrighted, 1922, by the W. R. C. Smith Publishing Company.)

Wrightsville Beach was the happy selection as the meeting place for the 26th semi-annual meeting of the Southern Textile Association. The convention was held on Friday and Saturday, June 2 and 3, at this popular seashore resort which has in the past been the scene of other enjoyable gatherings of the Association. Although it developed that slightly disagreeable weather was experienced on the first day of the meeting, and despite the fact that the time of meeting was rather early in the season, the attendance was good, and fishing, boating, surf bathing and the other modes of sport and pastime were indulged in by the delegates between the sessions of the convention. More than two hundred members registered at the meeting, and possibly three score more were there who did not find their way to the registration desk.

The sessions of the meeting were most successful and interesting. There was practical discussion in large measure which produced much information of value and interest, but perhaps the keynote of the convention was the relation of the human element in the mill to its success, and the importance of closer cooperation between the man directing the mill and his operatives. This thought formed the theme of several of the addresses presented at the different sessions, and was the basis of much of the discussion among the mill men themselves during the convention. The practical discussion and other features of the meeting are given practically complete in the seriatim report of the convention contained in the succeeding paragraphs.

Incidentally, it was peculiarly significant that this convention should be held at Wrightsville Beach, inasmuch as it was at a previous convention at this place that the first germ of the sectional or departmental meeting idea was given to the Association, in a paper read by F. Gordon Cobb. The presentation of that suggestion marked the beginning of the successful scheme of practical discussion meetings which have been conducted during the past year and a half by the Association and which have progressed to such a degree that the general chairman of sectional committee work was enabled to report, at this year's meeting, the accomplishment of results inestimable in their beneficial effects, and to predict, with past results as the basis for the prophesy, the attainment of infinitely greater things through the perpetuity of those influences which have contributed so much toward the development of the Associational work.

The convention consisted of three sessions, two on Friday and one on Saturday morning.

The Friday Morning Session

was called to order shortly after 10 o'clock by President Gordon A. Johnstone. The convention rose while T. A. Sizemore, of Greenville, made the invocation, which was followed by the assemblage singing one verse of "America" led by Secretary A. B. Carter. The chairman then read a letter from W. M. Sherard, a past president of the Association, who expressed his regrets at being unable to attend this, the first convention he had missed in a number of years. Due to pressing business matters in New York, however, he was prevented from being present, but sent his best wishes for a happy and successful meeting.

The address of welcome was next listed on the program, but due to the delayed arrival of Major Little, who was to welcome the visitors to Wrightsville Beach and Wilmington, this was deferred until Major Little could reach the hall, and on motion the president proceeded with the program, reading first the annual address of the president. This paper was an interesting comparison of conditions in the different sections of the textile industry, and several times struck responsive chords among the mill men present. Mr. Johnstone quoted at length from the recent address of Robert Amory, the new president of the National Association of Cotton Manufacturers, who made some pertinent remarks in regard to the trend of the cotton industry toward the South. Mr. Johnstone also made an urgent appeal to the superintendents and overseers of the South to exert every effort in reducing and eliminating insofar as possible the amount of waste and leakage in their industry, concerning which he read some interesting figures resulting from an investigation made recently in the textile industry. His remarks follow in part:

President's Address.

"During the past year the Southern Textile Association and its members have passed through probably as trying a time as has ever been experienced in the textile industry. We have seen readjustments taking place and a period of very poor business. Yet, notwithstanding all of these trying conditions, I believe that our mills in the South have passed through this crisis without any serious disruption and the present indications are that for the coming year business conditions will improve. Roger Babson states in his monthly bulletin that his survey in the South shows business conditions to be very much improved over a survey he made six months ago, and that the indications are that business will very materially improve in the South for the balance of the year and the first of next. It is interesting also at this time to note that there seems to be a prevailing opinion through the textile industry of both the North and East that the South is the logical place for the manufacture and finishing of cotton goods and these facts are borne out by statistics which were given by Mr. Amory, newly elected president of the National Association of Cotton Manufacturers, who states that 'The membership of the Association represents nearly 20,000,000 spindles, of which over half are in Massachusetts. In 1900 there were 15,000,000 spindles in New England and 4,500,000 in the cotton growing states. Today there are 20,000,000 in New England and 15,000,000 in cotton growing states, an increase of 34 per cent in New England against an increase of 248 per cent in the cotton growing states.

" 'One of the principal reasons for this rapid growth is assistance from Massachusetts laws given the Carolina mills by restricting hours of work away below theirs. In many ways our laws hamper and restrict our greatest home industry by other annoying and expensive pieces of legislation, not to mention far higher taxes.

" 'The record is clear enough, the cotton industry is gradually slipping away. In the past various factors have helped us. Massachusetts has far more skilled help and oversight. We had the finishing works where southern goods must be shipped to be bleached, dyed or printed. Now there is excellent skilled help and supervision in the

South. Finishing works are starting up by leaps and bounds.

" 'The results are appalling when North and South Carolina have now approximately the same number of spindles that Massachusetts has. In September the production of the Carolinas was 255,000,000 spindle hours, or 35.7 per cent more than Massachusetts. In November 58.1 per cent more. In December 43.4 per cent more. These two states and Virginia alone erected 8.500,000 new spindles since 1900 against Massachusetts' 4,000,000. These figures are from the United States Department of Commerce.'

"It is well to bear in mind that this organization," continued Mr. Johnstone, referring to the Southern Textile Association, "represents what Mr. Amory classed 'the management of the mills in the South,' and as this Association is called the makers of the cotton textile industry, it is well that we keep our minds open for every new idea and that we lay aside any prejudices as to the past methods and search out diligently that which will be for the decided benefit and improvement of the industry. With the raw material at hand and our modern factories and equipment, the problem resolves itself to the question of producing the quality of goods that will stand the highest criticism."

In taking up the subject of waste, President Johnstone said, "I was also very much interested in an article that appeared in the May issue of the Scientific American. It had this to say:

" 'The textile industry in the United States is said to rank second only to the iron and steel industry in the amount of money involved, and the invested capital is conservatively put at $4,500,000,000. In 1920 the value of its products was about $7,000,000,000, and all but $500,000,000 worth of the commodities were used at home. The industry comprises the manufacture of fabrics for wearing apparel, of carpets, of draperies, of blankets, of sheetings and of numerous other woven, knitted and felted materials. There are 12,964 plants in the business. The general status of the industry, gauged by a possible maximum of efficiency, falls much below the attainable standard; and the average of waste is put at 49.2 points the responsibility for which is as follows: Management, 24.7; labor, 4.7; and outside contacts, 19.8 per cent. On the face of it, the industry has still to cut down its wastage by nearly 50 per cent. Supposing that 20 per cent of the manufacturing cost be due to preventable waste, then the ultimate consumers are paying every year $1,400,000,000 more for these goods than they should.'

"This is a serious arraignment of the men represented here," said Mr. Johnstone, "and one that calls for the best thought and research that can possibly be secured and this is the reason that I say we should be open minded, aggressive and painstaking to eliminate these wastages, which are so graphically portrayed in this article. We members of the Southern Textile Association stand facing a period that probably will see the greatest development that has ever taken place in the southern states, and we should lend our assistance in every way we can in building up and assisting."

In conclusion, said Mr. Johnstone, "I wish at this time also to thank the officers and members of the Association, also the standing committees, for the loyal and splendid support given me during the past year as President. It has been one of the greatest pleasures of my life to associate with you fellows, and may I prophesy that this Association is now on the threshold of a new era where it can be of great use to the industry as a whole."

At the conclusion of Mr. Johnstone's remarks, the discussion on cloth tolerance, led by Harry H. Boyd, of Charlotte, was begun, but this was interrupted by the arrival of Major Little, who delivered the address of welcome, and which was subsequently responded to by L. R. Gilbert, of Raleigh, N. C. In order to retain the continuity of the cloth tolerance discussion, the address of welcome and the response by Mr. Gilbert will be reported at this point, and the practical discussion will follow in complete form.

Major Little made the usual happy welcome address. He dwelt at length on the accomplishments of Wilmington and New Hanover County, telling what they had done and hoped to do along agricultural, manufacturing and other lines, and concluded by a reference to Wrightsville Beach, stating that the old Mosaic Law had provided that one day

PRESIDENT GORDON A. JOHNSTONE.

in seven should be set aside by man for rest and recreation, and declaring that of all her facilities, Wilmington was most peculiarly proud of the playground of Nature which had been provided her, and extended, on behalf of the mayor and citizens of New Hanover County, a most cordial invitation to the mill men to partake of all the pleasures and enjoyments afforded at this famous resort.

In responding to the welcome of Major Little, L. R. Gilbert, of Raleigh, N. C., directed the trend of his remarks to a discussion of "the glorious opportunities that are unfolding themselves to the members of this Association." His address was generally accorded as one of the best delivered at the convention, and his eloquent and urgent appeal to the superintendents and overseers in the matter of dealing with their operatives struck the keynote of the convention and was the subject of much discussion throughout the remainder of the meeting. Mr. Gilbert spoke in part as follows:

The Human Side of Industry.

"It gives me great pleasure to have this opportunity to respond to the address of welcome so kindly extended to us by Major Little. I have known of Wrightsville for a long time, and am sorry that I haven't visited the city before. I realize that I am the loser. In behalf of the great organization which I have the honor to represent, I wish to tender to you our heartfelt thanks for the wonderful welcome that we are receiving; a verbal expression of which you have just so delightfully made. It is a very great pleasure for us to be here.

"In addresses of this kind I am not at all certain that I know the exact line of thought that the speaker is supposed to follow, but it is my desire to tell you of some of the glorious opportunities that are unfolding themselves to the members of this Association. You know this Association as a body of cotton mill foremen and superintendents, who meet to discuss, preferably, the best methods of handling the machinery, which is in their care, inanimate objects. We have been of inestimable help to each other in doing this, but it is my pleasure today, while I am honored as the voice of this Association, for a brief time to tell you of a greater and more wonderful mission that it is our duty to perform. I speak of our association with animate objects—humanity.

"The men in this room influence the lives of between 200,000 and 250,000 men, women and children. They mould their thought; they are indirectly responsible for most of the sorrows and pleasures that come into their lives —a great responsibility but a most wonderful mission. Each of us is associated with a small portion of this great number of human beings, and each one in his own way is trying the best he knows to serve his people that he may be better served. We do not know the best way to serve best, but our hearts are expanding, each year more and more, with love and understanding of the people with whom we live and have our being.

"The stockholders of a great corporation may pour their money into the treasury of their business, but until there is found one who understands and appreciates, it is a failure. But let some great heart go there, and begin his labor of love, and the whole organization becomes alive, and the hate, distrust and lack of confidence disappear. If you were making inquiries for a man you would invariably wish to know something of his intellect. In the greatest of all Books the word 'heart' is mentioned hundreds of times, while the word 'brain,' I believe, isn't mentioned.

"When the historian calls the roll of earth's favorite sons, he causes the immortals to stand forth as great thinkers, master minds, superb intellects, statesmen, inventors, speakers, artists. Nothing said about the great hearts that were the inspiration of these super-intellects. The throne of the universe is a Great Heart from which mercy and love are forced through the streams of life as the ocean forces its tides into every creek and river.

"The wonderful intellect of Christopher Wrenn planned St. Paul's Cathedral in London. Many years after, when the plans were yellowed with age and thick with dust, a great heart stood forth before the people of London and pointed them to an unseen God. And telling them of His generosity, collected funds to erect one of the most magnificent edifices ever dedicated to the worship of God.

"Erasmus was the great intellect that planned the Reformation, but Martin Luther was the great heart that broke the shackles of mankind and set the world on fire with his religious fervor.

"The great intellects of the world spent numberless years in an effort to obliterate slavery in America; but it was the great heart of Harriett Beecher Stowe who moved the hearts of America to action and freed the slaves. And it was the great heart of Abraham Lincoln who signed the Emancipation Proclamation and removed the biggest blot on the history of America.

" 'The heart is coloring industry today as never before.' There was a time when money and brains, one as cold and hard as the other, ruled industry. But today the successful industry has somewhere in its organization a great sympathetic heart, that understands and loves, grieves with those who are sad and rejoices with those whose hearts are glad.

"We, ourselves, have not as yet fully grasped the responsibility that is resting upon us, evidence of which has visited a great many of us within the last three years and is at present giving the best minds of New England great concern. However, we do not consider that we have not done the best we know to avert trouble in our business, but we were not awake to the glorious possibilities of the human soul. We didn't realize our influence. We never thought of our duty to our fellowman. We didn't take time to think that above all things, all people's desire is to feel that they are a part of something; that they are really helping to produce something. Regardless of how small a part they have had in producing the finished product, they like to know that their foreman and superintendent can see them in this piece of goods or in that case of yarn.

"We admit we have been pitifully slow, some of us, to make a start towards letting our people know that we are aware of their existence, but while we are in the A B C's of this human problem we are doing our best to show them that we are at least the friends of mankind.

"There was a time when the most successful foreman or superintendent was he who could drive best; instill into the hearts of his fellowmen and women the greatest amount of fear. "Fear of what?" you ask; fear of being discharged, put out of work; no money; no food; a family of God's creatures to feed and clothe; fear of uncared for illness in the family; fear of charity; fear of public opinion, for everyone has a desire to be thought well of; everyone has friends and acquaintances, however humble they may be, whose respect they most earnestly desire, and before whom they dislike to be humiliated.

"There was a time when even we, the foremen and superintendents, thought that we had done our full duty when we had paid them the wages we promised. We didn't know or care how they lived or what they made. I have had this sentiment expressed to me by one of the largest cotton goods manufacturers in the South. It has been years ago, and I hope never to hear it again.

"Major Little, I am delighted to tell you that your city is today entertaining a body of men who have grown and are growing away from these sentiments. You are entertaining a body of men who look beyond the money they pay to the people with whom they are associated. A body of men who are placing themselves in spirit and imagination in the other fellow's place, and actually feeling the

joys and sorrows of their people. There is no sickness in which they are not standing by to call to the aid of their friends the best that medical science can offer. There is not a birth or a death that they do not rejoice or grieve with the family. There is not a home whose purity and sanctity isn't protected to the best of their ability. I feel much honored to be an active member of an Association whose ideals are so laudable, and who have such excellent opportunity to serve, an opportunity of which they are taking advantage and bettering mankind."

Discussion on Cloth Tolerance and Defects

The exhibition of samples of "first-class" goods which contained defects which rightly classified the goods as "seconds," the demonstration of the need for a closer and more rigid cloth examination and inspection process in the mills, and discussion pointing out the evils of defects, both slight and large, in subsequent processes through which the cloth passes, and the recounting of methods of eliminating these defects—these points featured the discussion on cloth tolerance and defects at the Friday morning session. This discussion was led by H. H. Boyd, who has been a leader in this phase of the Association's discussion work. In beginning the discussion, Mr. Boyd emphasized the point that general discussion from all members interested was desired. He recalled the discussion at the previous semi-annual meeting in Charlotte, which followed an interesting paper by William H. Harris, vice-president of the Liberty Textile Corporation, of New York, on cloth tolerance. (This address and the discussion which followed can be found in the report of that meeting which appeared in the October, 1921, issue of COTTON.) "I think Mr. Harris has started something," said Mr. Boyd, "which will be of great benefit to every superintendent and overseer of weaving and cloth room, and also to the whole world at large. If we could perfect a system of tabulating an imperfection in a piece of cloth that would be accepted, we would have a fixed standard to work for and besides knowing when we made a piece of cloth that we had done our work with some degree of satisfaction, we would know that we were right.

"For instance, in a piece of 80 x 88, 5.00-yard goods, which I am making, upon reinspecting, the following imperfections were found—and this after the cloth had been laid aside as first-class goods—

80 x 80—39-inch—5.00
20 pieces of cloth, 124 yards each.
10 bad places scratched up for warp thread.
13 thin places scratched up for filling thread.
134 bunches clearer waste and yarn bunches.
40 loose strings where weaver had drawn-in end.
8 dirty filling marks.
20 double threads from filling changes.
Width of cloth, 38¾ to 39¼; should be 39 inches.
Threads, 79 to 80.5 in warp.
Picks, 87 to 88 in filling.
Weight of cloth, 4.98 to 5.02.

"Now the question we would like to determine is: Is this a first quality shipment or delivery of carded 80 x 80, 5.00 yard, 39-inch cloth? I would like to hear from some of our members, if they have re-inspected any cloth, as to what they found in their cloth."

At this point Mr. Boyd exhibited samples of various kinds of goods which, he stated, had been passed up through the regular methods of inspection as first-class goods. These samples were passed around the audience for inspection and discussion, and prominent among them was a pillow-case which had been bought over the counter as first-quality goods, and which created considerable discussion. The expression of President Johnstone, when this pillow-case was exhibited to him by Mr. Boyd, was that "it looks to me like a piece of Mexican openwork," and this perhaps best describes the condition of the article. Other samples showed oil spots, scratch-ups, slugs, "sluffed off" filling, and other defects which "under no circumstances should be permitted in first-class material."

In discussing the pillow-case on exhibition, Mr. Boyd declared that one of the claims of the buyers is that the

JOHN W. CLARK, PRESIDENT-ELECT.

manufacturer must get the defects out of the goods, else their products are damaged; but, he pointed out, they do not always get them out. "If we were to make as much fuss about the goods we buy as the buyers make about the goods we make," he said, "we would have much better goods for our use."

In this connection, he called upon John W. Clark, vice-president of the Association, who, as chairman, at this time made the

Report of Cloth and Finishing Committee.

"The finishing committee," began Mr. Clark, "has been in correspondence with a number of converters and finishers of cotton goods, and they have been kind enough to send us a number of samples and to also make some suggestions that should be of value to us. Most of the things they say are not new, but they are worth emphasizing. One converter said that the average mill seems to think that the finishing plant is the 'cure-all' for all the imperfections

of the weave room. Goods you would not send direct to the retailer you send to the finisher. We all do know that the standard of quality is no higher than the man in authority in the plant demands that it be. Does the average cloth room receive the attention that its importance demands?"

Mr. Clark said that at one of the previous meetings he was very much interested in a discussion that was brought up on the question of eastern made goods bringing higher prices than southern goods, and attributed this to the fact that in the northern plants a much more rigid system of inspection is applied to the cloth than is the case in the southern mill.

He then displayed the samples of imperfect cloth sent him by the converters. In connection with one of the pieces, he said that two converters had called attention to the fact that when a piece of streaked goods is sent to a converter who has to singe it, the thin streak causes the piece of goods to be burned in two. Another thing, he said, to which they called attention, was the question of oily filling. "If you are sending goods to the bleacher, and you let the filling drop on the floor and get oil on the yarn, and then it goes to the converter who has to bleach it, it leaves oil streaks, and these oil streaks do not bleach out. It really ruins the goods." Mr. Clark pointed out that the same thing is true in unbleached goods, a sample of which he demonstrated, where through the carelessness of the weaver oil had gotten on the goods, causing an increase in the amount of seconds and remnants. Another bad feature referred to by Mr. Clark was threads left on the face of back-filled goods.

Another important thing, he said, was the question of gouts on the yarn, especially in the finer grades of goods. When these come through the calender rolls on finishing they break out and make holes in the goods. Another defect illustrated was stringy selvages.

"Another thing the converters talked about," continued Mr. Clark, "was that when you send goods to them, do not sew the seams, but send the pieces by themselves." He explained the difficulties encountered in the finishing process if the pieces are sewed together. Another converter complained about tight selvages, he said, and declared that very often tight places in the selvages will break or crack in the finishing process. Another thing they had talked about recently, he said, was a hard substance in the goods which resembles a weaver's pick-out comb. These get caught in the rolls of the finishing machinery and do damage, he explained.

Mr. Clark expressed himself as very much interested in the pillow-case displayed by Mr. Boyd, saying that he had made a few pillow-cases, and "when you send the goods out and put them up in dozens they have to be absolutely perfect goods. If there are any defects they go into seconds. If there are any holes in them you can't sell them at all."

He then reported that a certain mill had given him the following figures resulting from a re-inspection of "first-class" goods: In 100 yards of cloth they found 60 or 70 places scratched up; 25 places where they had streaks of oily warp and 25 places of oily filling that would not bleach out; 12 thin streaks, and 20 gouts.

At this point F. Gordon Cobb, general chairman of the Association's sectional committee work, said that "merely for the information of the weavers and cloth room men who were not at the last sectional meeting, I would like to state that the cloth tolerance that Mr. Boyd is trying to get started is to find out what minor defects will go into 'firsts.' In other words, we know that it is practically an impossibility to make a perfect piece of cloth 120 yards long; there will be some few minor defects, and what we are trying to establish is how many and what kind of these minor defects will be acceptable in 'firsts.' At the Greenville meeting we asked for six mills to give us a report at our next weaver's meeting, that report to be compiled as follows: To have their cloth room overseer or someone else who knows a piece of cloth, to pick over one or two cuts each day that have been passed as firsts, and turn through that cloth and make a note of every little defect he finds—hanging threads, selvages misdrawn, thin places passed, slugs of filling in the cloth and in the warp yarn—and to see how many of these are allowed to go away from the plant and are being accepted as firsts. The idea then is to compile one report from that information so that we can look forward to establishing what would be known as 'first-class' goods. Then if any defects come up later we will have something to come back on." He then asked for anyone who had promised to make these reports to do so at this time.

In response to this request, W. P. Leister said, "I agreed to make a report, and we did keep a report, but my understanding was that we would not be called upon at this meeting, and I did not come prepared to report."

"My understanding was that they would be returned at the next weavers' sectional meeting," added W. H. Gibson, Jr., of Union, and Jas. A. Chapman, Jr., of Inman, said he was in the same shape. This being the prevailing understanding, it was decided to hold these reports until the next sectional weavers' meeting, when they will be presented.

"This is your meeting, men," said Mr. Boyd in continuing the discussion, and called upon W. H. Gibson, Jr., chairman of the weavers' division, for a statement.

"I did not know that we were going to discuss the details of cloth tolerance at this meeting," responded Mr. Gibson, "but I am always interested in making better cloth and more of it. Just recently we had a political campaign in our town and it seemed that half the people in the town were running for some office. One day I was going through the mill, pretty fast as I always do, and one fellow who is a talkative sort of chap anyway asked me, 'What're you running for?' I replied, 'Better cloth and more of it,' and I think that is a motto that all of us might take to advantage."

In discussing the pieces of cloth that were being passed around, and particularly the oil spots on the filling, Mr. Gibson said that there is a preparation on the market that will take the oil out when it goes through the finishing plant.

"While I am talking about cloth," he continued, "in the article that I wrote in reply to Mr. Harris, I mentioned one fact that there has not been much said about, and that is the length of a piece of cloth permissible to go into firsts. Now a piece must have 40 yards of cloth in it; otherwise it will be seconds. It has always occurred to me that there was no need of putting cloth into seconds if it did not run the entire 40 yards. I think it should be reduced to 20 or 25 yards. As it is now, if we have 39 yards it is seconds. I believe if the standard was lowered, the

defects could be cut out. I have really never seen any reason for having 40 yards as a standard other than that the bleachers wanted to have it that. As I understand it, we are trying to establish standards, and I certainly would like to have that discussed along with the others."

Mr. Gibson took exception to the inference by Mr. Clark that better quality is the cause of higher prices for northern goods over southern made materials. He pointed out that the prices are based on several things; first, the northern mills are closer to the markets and can make delivery much quicker than the southern mill; railroad freight rates were pointed out as another cause; and the fact that the northern mill can get its cotton at a cheaper rate over water route from Texas.

T. W. Mullen, superintendent of the Rosemary Manufacturing Co., Roanoke Rapids, N. C., was next called upon. "I was just talking with Mr. Clark on the train coming over," said Mr. Mullen, about a complaint we had had on two different occasions, where some cloth had been cut by a small wire. The first occasion was about 18 months ago; the buyers sent back two little pieces of wire. One of them we could tell readily what it was; it was a tip off of one of the jacquard needles. (Mr. Mullen explained that they are making cotton damasks.) We could tell this was one of the needles, but the other wire was smaller in diameter and corrugated or twisted. I found out that it did damage to about a hundred yards of cloth.

"About two months ago they sent in another piece of wire just like that piece, and we searched and searched for it again, and finally I happened to be talking to one of the loom fixers, but he said he didn't know where it came from. About two hours after that I happened to see him again, and he told me he had found out where the wire belonged. This little wire was used at the bottom of the Draper picker—just a piece of wire imbedded in there. I looked, and sure enough, that was certainly where it came from. Possibly some of the other men have had the same trouble and found it before, but that was our first time.

"In making our cloth," continued Mr. Mullen, "we have got a different character of cloth than sheetings or plain cloth, and our defects are generally different, but I believe we have more trouble with oil than most anything else. Mr. Gibson spoke of washing it out. We use a preparation for this, but some of the oil will come back anyhow. We have defects in thin places and scratch ups, possibly these can be passed up more easily in damasks than in sheetings. That one incident of the piece of wire was the only point I wanted to make. Since that time, in buying pickers, I have requested that that little piece of wire be left off and this has been done."

"Is anyone using a preparation that you merely apply and do not rub?," asked Mr. Cottingham, of Greenville. "Most of our mills are using a soap and rub the oil, but I understand some are using a compound that you simply apply and do not rub, and that it will not mildew."

"Is Mr. Hamrick in the house?" asked Mr. Cobb. On receiving a negative answer, he continued, "Mr. Hamrick, at our last weavers' sectional meeting, reported that his firm had found a compound or soap that all they had to do was to apply it to the piece of cloth that had oil in it and they would not have to rub the cloth; merely apply this compound and then when it was bleached the oil would be out."

Mr. Cobb further reported that they had experimented with some of this compound, taking several small pieces of cloth that were badly damaged with oil, and then putting oil on the cloth; then, he said, some oil was taken from around the whip roll and put on the cloth. The pieces were then sent to the bleacher after having been treated with the compound, and when they were returned, the oil was out. "Of course," said Mr. Cobb, "there were some few places in the cloth where a slug of filling got in and the oil would not come out. But I do believe that except in extreme cases, this would do the work. Of course, mills that are shipping their goods to the customers that inspect the cloth before it is bleached might not be able to get by, but I understand Mr. Hamrick's firm probably have their own bleachery and that permits them to treat their cloth to take the oil out at the plant. This compound is the best thing that I have ever seen, and either Mr. Hamrick or I can give you further information."

J. M. Alexander, Newry, S. C., discussed the matter of oil spots further. "We have a report that comes to the office as to seconds each day," he said, "and we find on that report marked useless, referring to oily filling, the oil getting on the yarn after it has been made. In discussing this with the weaver I found out that most of it came from the filling hauler, and I changed our filling boxes on the loom and made them in the shape of a hopper." This change in the shape of the boxes, reported Mr. Alexander, had a tendency to cause the filling to stay in the center of the box, and saved a lot of black oil from dropping on it. "It saved a lot of oily filling," he said, "and I believe it is a good thing for all weavers to make the filling boxes on the looms, hopper shape."

"I agree with you," said Mr. Boyd. He said he made a visit to Mr. Cobb's mill and saw them doing that and came home and did the same thing. "I believe with you that it is a good idea, instead of having the filling box square, to have a piece on the side of it, and make it hopper-like. It will keep a great many bobbins off the floor, and we get most of our oil off the floor rather than off the machinery."

Carl P. Thompson, of Trion, Ga., next discussed the question of mill inspection. "I think the samples submitted here this morning is evidence that we can accomplish a great deal more by a more rigid inspection in our mills," he said. As an example, he told of a mill who complimented themselves on having only one-half of one per cent seconds, while another mill's seconds run from 18 to 20 per cent, yet this same mill with the high percentage of seconds in many cases sell their seconds for the same price they get for their firsts. By a rigid system of inspection the firsts and seconds are both raised in quality.

"I believe we all appreciate that Mr. Boyd and the committee on cloth tolerance have quite a task," he continued. "It depends largely upon what a piece of goods is going to be used for as to how many imperfections it will be allowable to pass up. Those of us who are making a particular kind of goods usually know what that cloth is going to be used for, and I believe we set up our own standards, yet I believe that by a system of more rigid inspection we can accomplish more for our mills. I was in one of the northern mills last fall, and one of the things that I noticed particularly was the rigid inspection. They inspect the goods very, very closely, and I think that is one of the things we need to do."

Continuing this discussion, Mr. Boyd spoke as follows: "Not long ago a party made a complaint about a piece of cloth, and said that another mill was making a much better piece of cloth than the mill in question. That caused considerable stir around that plant and all the men were at their wit's ends to know how they could improve the quality of their goods. After a great many weeks of work they got a line on the other mill that was making a better piece of cloth and learned that this other mill was making the goods from double carded yarns, and, of course, double carded work makes better thread than single carded. The man who is using the goods made from the double carded yarn is now trying to get the other men who make this same kind of goods either to make a concession in price or else raise their standard to that of the other mill." Mr. Boyd pointed out that the same thing holds true in the case of a Draper loom with feelers and one without feelers, the former making much better work.

Following Mr. Boyd, Mr. Cobb took the various defects pointed out by Mr. Clark and suggested remedies for them. Holding up the piece with the hanging threads on it, he said that one mill runs this kind of cloth through the brusher in one direction and then reverses it and runs it through in the other direction. Another mill, instead of running it through the brusher twice, runs it through the machine in the ordinary way and then turns it on a table and gets the hanging threads off by hand. "These are two methods of mills that have been able to thoroughly eliminate that defect," he said.

The next defect he discussed was that of the tight threads in the selvage. "I think all the weavers know that he is talking about," said Mr. Cobb. "If a thread comes up loose in the warp we have to put that in the selvage, and it is a very easy matter for the weaver to draw that into the same harness eye where there is already a double thread, and if the selvage is too heavy, that part of the selvage will not stretch as much as the body of the cloth." As a remedy for this he suggested having a worker stand by when the pattern comes back to the tying-in machine, to correct the mistake.

A member asked if an uneven selvage might not come from a crooked beam on the slasher, and Mr. Cobb replied that that certainly is possible.

"You fellows are all discussing white goods, and nothing has been said about colored goods," said L. R. Gilbert, of Raleigh. "I am having a great deal of trouble in weaving flat threads and putting in flat threads in ginghams, with two threads coming through the same drop wire and harness eye and reed, and it doesn't take up the same as when it is weaving plain. I want some suggestions as to the best way to stop this flat thread from kinking in the cloth. About 50 or 60 per cent of our seconds come from these kinky threads."

The first reply was from J. W. Ingle. "I am not a weaver," he said, "but I can tell him how to stop that: By putting a rod under those threads and then having a pulley overhead, and then when the cut marks come through it will draw these threads up." Mr. Gilbert stated that this could not be worked in his plant because of the length of his cuts.

"Run a fairly tight warp, set your harness level, with the reed about 3 to 3½ inches from the fell of the cloth, and use a high whip roll"—this was the suggestion of Mr. Gibson for the trouble.

Referring back at this point to the question of hanging threads on cloth, Mr. Johnstone explained an attachment for use on the brusher, which consists of a rod with a spiral groove extending over its length, which is attached, one on either side of the cloth, and revolving, removes the loose threads from the cloth. He stated that 90 per cent of the loose threads could be removed in this manner.

This concluded the discussion of the morning session, which was adjourned following the reading of a number of messages to the meeting for a successful convention. One of these was a telegram from the management of the Southern Textile Exposition, inviting the mill men to the Fifth Southern Textile Exposition which will be held in Greenville next October; the telegram advised that all the exhibit space in Textile Hall had been contracted for, and the coming Show was expected to be the best ever.

Following adjournment, Mr. Thompson, of Trion, suggested that a meeting be held in the evening of all the men interested in the welfare of their operatives in a religious way, he stating that he would like to meet personally and discuss with these men what is being done all over the country in this respect. President Johnstone advised Mr. Thompson that a meeting of the Southern Textile Social Workers' Association would be held at Gastonia during the month of June to discuss those particular subjects, and regretted that the program did not permit of the discussion of these features at the Wrightsville meeting.

The Friday Afternoon Session

included a discussion on opening, mixing and picking, led by B. R. Burnham, of Whitney, S. C.; the presentation of the report of the Spinners' Committee, by Carl R. Harris, of Lancaster, S. C., the chairman of the committee; and an address by L. T. Davis, of New York City.

Mr. Davis' talk had been scheduled for the morning session on Friday, but due to a misunderstanding, the speaker did not arrive in time to address the Association at that session, and in presenting him to the audience, President Johnstone announced, with regret, that in order to carry out the afternoon program as arranged, it would be necessary to limit Mr. Davis to a fifteen-minute speech. His subject was the question

"Will Foremen Study?"

"The question that has just been read you might seem an invidious one, and in fact your first impression might be regarded as correct," declared Mr. Davis. The question of study, he pointed out, is one of personal disposition rather than the chance position that a man holds; that the ambitious, forward-looking man is using every agency within his reach for accomplishing the best results in the work he is doing.

The attention which has been given this matter within recent years, said Mr. Davis, indicates the importance that is attached to the personal effort of foremen to get hold of the thought and experience that actually bears on the problems that confront them, and he referred to work by the Federal Labor Board, state universities, individual corporations and others which emphasize the importance of getting the average overseer to study matters relating to his work, and also the best methods of accomplishing that result.

"Let me dwell upon the first thought for a moment," continued the speaker. "Why is it so important in their work? You will agree with me that real efficiency in pro-

ductive effort in all mills depends finally upon the individual worker. It is the attitude he takes toward his work, it is the cooperation he gives, it is his skill, which counts ultimately in the results you get. In the past we have laid stress upon the development of labor saving machinery, and certainly in the textile world this development has been in the past 100 years carried to a remarkable extent. We have laid stress upon the utilization of material, and the presence of the textile industry in the South is largely dependent upon its ready access to cotton. But while this is entirely correct, we have come to see that where in the past we have laid stress on machinery and on the utilization of materials, in the future we will have to lay stress upon the use of men, and it is by doing this that we will accomplish more than by stressing labor saving devices and the extension of our natural resources."

In the second place, Mr. Davis declared, the enlightenment of these men is important because "this foreman, overseer, this man in direct contact with the worker, is the man upon whom you must depend for the development of the workers in bringing about that *esprit de corps* which is so essential in any successful organization. The foreman has to interpret the management to the worker and the worker to the management, and in addition he must

MARSHALL DILLING, CHAIRMAN OF THE BOARD OF GOVERNORS.

be a leader, for there lies in him the responsibility of leadership. It is he who actually comes in touch with the man at the machine.

"The average foreman will agree with me," Mr. Davis continued, "that little provision is now made for his preparation for this particular phase of his work. We do not have it in the schools, in the universities; they do not attempt to teach him how to handle others. We do not have it in our plants. Sometimes stress is laid upon it, but such instances are the exception to the rule. A practical experience does not necessarily give a man this executive capacity, so that you will find a great many foremen agreeing readily that this is one important phase of their work for which they have had no preparation prior to the time they are put in charge of a department."

"Furthermore, he is generally a man of energetic ends, commanding personality, and other qualities by reason of which he has been placed in an executive position, and these characteristics appropriately equip him as one who can be counted upon to utilize the present possibilities for the betterment of his work, to enable him to take the steps that lie before him."

Considering next the securing by the foreman of real results from the study he is to engage in, he asserted, the information given must be definitely practical, and it must be in concrete form. These men, he said, are accustomed to dealing with facts, not theories. "We need to talk to them about the elements of personal character, we need to bring to their attention that there are more ways of handling individuals than by appealing to one single emotion—fear. The human heart is a heart of a thousand strings, and the man who is controlling the destinies of other men needs to learn the fundamental human emotions; he needs to understand the value of kindness; he needs to realize something of modern methods of handling materials and men—these are the things that should be brought to his attention in an interesting form with a definite result to be aimed at.

JAMES A. CHAPMAN, JR., VICE PRESIDENT.

"The gist of my talk," concluded Mr. Davis, "is that you have a great many matters to discuss in your meeting here, and every one of them will bear upon the practices and machinery in your plants, but I want to say that the biggest problems that confront you are not problems centering in your machines, they center in the men and women who operate your machinery. The South has a great many elements that tend to make it successful in the textile industry, but the first thing is an enlightened body of executives who are aiming at getting definite results from the workers under their direction. When you get that, you will accomplish the most rosy dream of the most enthusiastic member of your body concerning the industry in the sections from which you come."

The next feature of the program was a discussion, led by B. R. Burnham, of Whitney, S. C., on opening, mixing and picking. In opening the discussion, Mr. Burnham

said, "this question of mixing has always been a big one. It is one that many of us have no way of overcoming because we do not have sufficient floor space. Again, it depends on our numbers of yarn—a man might get very good results on coarse numbers by very little mixing where another fellow would fall down on finer numbers. I hardly know where to start this discussion, but I would be glad if some of you gentlemen who have asked these questions at previous meetings and had them held over would bring these questions before this meeting again, but be sure to mention the length of staple and what numbers of yarn you are running it into."

Opening, Mixing and Picking Discussion

"Suppose you tell us how you prepare your cotton," suggested Mr. Boyd to Mr. Burnham.

"Well," Mr. Burnham responded, "our cotton is prepared for coarse numbers—13s warp to 24s filling—we open ten bales, preferably mixing from different lots, but our warehouse room is so limited that we sometimes have to take as much as half from one lot of cotton. We take all except two bands off the bales and let it sit for 48 hours and then it is opened up on one side and fed directly to a No. 4 bale breaker, then into a Creighton opener, then through a conductor pipe and into the Morton distributor."

"How much waste do you get from the Creighton?" asked Mr. Boyd. "It will average ¾ of one per cent," was the reply.

"Another good discussion has been started on Creighton openers in tandem," continued Mr. Burnham. "It was called to my attention this morning, and from what I have thought of it, it strikes me as a pretty good idea. You can clean by more processes in your carding and picking, but you are not doing the cotton a bit of good, but in the Creighton you can get this cleaning and I can't see where it could possibly hurt the cotton."

W. H. Jones, LaGrange, Ga., asked Mr. Burnham if he had found any iron coming through the Creighton, such as buckles, etc. "We have not experienced this as yet," replied Mr. Burnham. "I don't know whether it is due to the efficiency of the No. 4 breaker or not, but I have never seen any coming through."

Mr. Jones then asked, "Has anyone had any experience with a magnet on the feeders to eliminate iron coming through and getting to the licker-ins on the cards?" In replying to this Mr. Burnham related an experience at the Naumkeag Mills. "They were having a great deal of trouble," he said, "and they put screens and magnets just above their feeder aprons and they find that it has done great work for them." He said that the engineer of the Fulton Bag & Cotton Mills had told him that this plant was doing some experimental work along this line.

The discussion at this point involved the mention of names of certain engineers and firms who were doing work of this kind, but President Johnstone announced that it was one of the rules of the Association in their discussions never to advertise any particular organization or machine, and that this would have to be ruled out of the discussion.

In reply to a question, Mr. Burnham stated that in his opening he mixes about two inches from each of the ten bales opened on the apron of his distributor. Ira B. Grimes, of LaGrange, Ga., asked what became of the cotton after it goes through the No. 4 bale breaker and the reply was that it goes into the Creighton opener and then is run straight to the machine; this is on coarse numbers, it was pointed out, and that on finer numbers the arrangement would probably better include an airing and ageing.

Mr. Chapman, on being questioned, stated that he had had no iron coming through his Creighton. Mr. Burnham stated that he thought probably the lift apron on the bale breaker drops the iron out, although he had made no investigations in this connection. Mr. Johnstone explained a magnet device which is attached at the bend of the pipe, and which, he stated, prevented all metal from getting by it. He said that it is a simple proposition and that any electrician could fix it up for a mill.

The question was asked if anyone had found that the Creighton opener curls the cotton. "I have never found that to be the case," replied Mr. Burnham. "If you run them too fast it will do it," contributed Mr. Gibson. "What speed?" was asked by Mr. Burnham. "810 r.p.m.," was the reply. "If you get above that it will curl it a little bit."

In reply to a question from Mr. Burnham, it was indicated that about ten of those present were running the Creighton opener around 800 r.p.m. Mr. Gibson said his was run between 725 and 750 r.p.m. On being questioned by Mr. Grimes as to how many bales is put through in ten hours, Mr. Gibson replied, "10,000 pounds a day a machine."

"I run at 705," said Mr. Burnham, and in reply to a question said his production is about 30 bales—15,000 pounds—a day.

At this point Mr. Gibson related a little experience in his opening room, as a bit of information. "I have not gone very far into this matter," he said, "but so far have gotten good results."

His experiment was in connection with extracting sand from the cotton, and he said he has erected a rack on the conductor pipe, the same size as the pipe, but beneath it, and he finds that he gets this full of sand every day. "The way I conceived the idea," he continued, "was that I noticed the hand holes in the pipe were always full of sand." He had the occasion to put in a new pipe, and added the attachment described, and found that he gets out a half a bushel of sand a day. "If I had it to do over again," he added, "I would put in a dozen of them."

"There has been a little agitation about what Mr. Gibson has just spoken of," supplemented Mr. Burnham. "The argument against that system is that you are getting back to the old cleaning trunk. Any of you who have ever run the old wooden cleaning trunk know that you are up against it and you get picker room troubles sure enough. The argument against that is that the dirt you get out is mostly sand and other heavy material that would drop out anyway in the next process. I am advancing that argument for what it is worth. Personally, I believe the time to take out dirt is when you can get it out, and in the handiest way."

Mr. Jones, of LaGrange, asked, "How many use grids and how many use screens in the Creighton opener? One

is a sheet metal screen, perforated, and the other is a grid."

"I have used grids and I have used the perforated screen," responded L. L. Brown in reply to this query, "but at the present time I am not using either one. I find with the grid you will take out more short staple than with the screen, and it seems to me that the yarn mills will take the grid where the cloth mills will use the screen.

"Speaking of vertical openers," continued Mr. Brown, "we are going to put these in at our No. 3 Mill, but instead of putting in one vertical opener we are going to put three in tandem. Of course the bale breaker will go in front of them. We are going to run the first 700 r.p.m., the next 600 r.p.m., and the third will run 500 r.p.m. According to a test made in one of the eastern mills—and there are six eastern mills that have Creightons in tandem—on the test run there the first Creighton took out .85 of one per cent of waste; the second took out .75 of one per cent; and the third took out .65 of one per cent; making a total of 2.25 per cent of waste taken out by the three openers."

"There is a question that comes to my mind," said Mr. Burnham. "Following that on through the pickers, how much did the Creighton openers get that the pickers would not get anyway?"

Mr. Chapman said that he understood that by using the Creighton in tandem, a mill is enabled to cut out one process of picking. "We are going to do that," replied Mr. Brown. In response to a question, Mr. Brown stated that he will use perforated screens in all his vertical openers.

Mr. Johnstone told of a test with Creightons in tandem whereby the mill took an ordinary cotton and ran it through them, producing an effect very much resembling a middling cotton.

David Clark asked Mr. Burnham, "If you were going to build a new mill what would you use?"

"This Creighton in tandem proposition," responded Mr. Burnham, "is a new one on me, but I like the way it listens. If it works as good as they say it does I should use it and then, say, a bale breaker similar to the number four with the Creightons, then a conductor pipe to a Morton distributor, and automatic feeders on the breaker pickers. We have something like that but we are not getting the cleaning that we should."

Mr. Clark said he understood that some mills were putting in the Buckley opener after the bale breakers. He asked Mr. Burnham what he thought of the idea, and the reply was that it might help but probably not in proportion to the cost.

"Before you get away from mixing," requested Mr. Grimes, "you said you opened up ten bales. Would it be any better to open up more if you could?"

"Yes sir," was Mr. Burnham's immediate response, "and we would do it if we had the space. For any one with the space, it is a very decided advantage."

Mr. Grimes then gave his own method. They open 35 bales a day and take all the bands off, for 7s and 14s. This will last his mills about ten hours, and he opens up 35 bales at a time and lets it age for one day. He has an opener in the room with four hoppers.

"Does anyone find that the man at the bale breaker is feeding too large pieces of cotton, and what mechanical means have you taken to overcome that—leaving out the human element?" was the next question put up for discussion by Mr. Burnham. His reason for asking this question, he continued, was that there is a tendency among the men who feed these machines, inasmuch as they are remote from the rest of the mill, with very little supervision, to grab up an armful of cotton, making the mixing really come from three or four bales instead of from ten or fifteen, in order that they might get a little "rest period."

Mr. Gibson reported that to overcome this, he had installed a long conveying apron which he had made so narrow that the man could not put in a large slab of cotton at a time. He stated that this was a very satisfactory arrangement. On each side of the apron, he said, they have room to put down 30 or 40 bales, so that "we are using on one side while we are putting down on the other." One negro, he said, feeds about 20,000 pounds a day with this arrangement, and "it isn't a very hard job at that." He said that he was considering putting in some strips across the apron so as to make it more difficult for the feeder to put large slabs on the apron.

J. O. Corn, of Columbia, S. C., asked Mr. Gibson if he has the automatic feed control for the hopper, and continuing said that his mill uses this system. They use from ten to fifteen bales to a mix, and try to get it so that when it comes from the apron it is a part of each of the fifteen bales. One operative feeds two of these machines.

"We are mixing differently now," reported J. O. Edwards, of Lancaster. "We are now going around the room laying down the cotton until we get about 60 bales down, and then we have a wagon that takes the cotton from these 60 bales into the hoppers. I believe we are getting better results." This is with 1 1/16-inch staple, for 30s to 40s yarn.

"How long does it age?" was asked, and Mr. Edwards continued, "We have two rooms; we open up and it lies there about ten to twelve hours in one room, and probably 24 hours in the other room. We try to keep it in the room as long as possible."

Discussing remote control for bale breaker rooms, Mr. Sizemore, of Greenville, said, "We have a complete system by which the man in the picker room can have absolute control of the speed of the openers at one and all times. This is a device that we worked out ourselves. Our openers are driven from a variable speed machine, and we operate this machine by means of a cable from the picker room. On the wall of the picker room we have a pulley with a hand-wheel on it." He then explained an indicator which they have on the wall, in the middle of which is 0 with 1, 2, 3, etc., going down and up the scale. When the finger is run up on the scale it runs the feed faster, and when the picker room man is getting more cotton than he needs he can slow the openers down. By giving the picker man control of the openers in this manner, continued Mr. Sizemore, they have no overflow at the end of the distributing apron. "We have had it in operation about six years," he concluded, "and it has never given one minute's trouble."

Mr. Burnham told of a device of this character which is electrically operated. There is no cotton on the floor at any time, he said, and the hoppers are right all the time.

Mr. Cottingham asked if "any one had had any experi-

ence with eveners on breakers." Mr. Chapman replied in the affirmative, but added that this improvement was made at the same time he installed his Morton distributor, and while he had some improvement, he could not attribute it wholly to one or the other of the two devices. Mr. Cottingham reported that he had tried it in his waste plant with very good results, and intended further experiments with it. It will eliminate unevenness in yarn, he contended, and this opinion was supported by Mr. Gilbert, who said he gets fairly even work.

Mr. Burnham referred to the "lap splitter" on the finisher picker, and asked if anyone had tried a little screen at that point in connection with the plate to allow the dirt to drop through. "Instead of putting in the screen," responded Mr. Boyd, "we took the plate clear out, and put in wire, and you would be surprised at the amount of small leaf and neps that drops through." In explaining this arrangement, Mr. Boyd said that the wire is bent from the rod over to the bottom of the condensing roll. The wires are put in about 2½ inches apart and the cotton passes over them.

The next question from Mr. Burnham was, "How many have equipped their picker aprons, either on the finishers or intermediates or both, with ball bearings?" Ten men answered in the affirmative. Mr. Cottingham said he had found that it relieves the tension on the apron, and should give better results generally. W. C. Cobb, of Ware Shoals, was called upon for his experience in this connection, and said,

"About two years ago I began to fool with ball bearings on pickers. A fool drummer came around and talked ball bearings on pickers until, to get rid of him, I tried them on one set of machines, though I didn't know just what I was doing myself. Finally I had a man go from my office and weigh the laps from these pickers. Then I had him weigh the laps from all the pickers. We had been putting back about 40 per cent of the laps. I then equipped all the aprons and eveners and we are now getting less than one per cent of the laps set back."

"There is still one more place where ball bearings should give great results," suggested Mr. Burnham, "and that is on the little shaft on the quadrant that works on the evener rack."

Mr. Grimes, of LaGrange, asked Mr. Cobb if, in referring to laps, he meant the whole lap or one yard of lap. The reply was, "The whole lap." Mr. Grimes then asked for the variation in one yard of lap, but Mr. Burnham stated that he did not have the figures on this with him, but agreed that there would be some variation there.

"I have to bring my goods up to a certain breaking strength," continued Mr. Cobb. "Anyone who has never been up against that doesn't pay much attention to the small things, but when the selling agent gives you just so much, say 75, you begin to look around for the little things. You will get busy and look around and see what is causing the trouble when you get some bad reports. I began in the picker room, and I was surprised to see that I was throwing back 40 per cent of my laps. You understand, the 'nigger' wasn't throwing back 40 per cent all the time; he wouldn't make that much work for himself. But when I put a man in there and said 'Throw back every lap that is not up to standard,' I saw what I was getting. I equipped my picker room with ball bearings all the way through, and kept that man in there, and some days now we have perfect reports."

Mr. Burnham also referred to the standards established by selling agents. "I don't know where they arrive at these standards," he said, "but I have never seen one that was too low."

It was necessary at this point to bring this discussion to a close, owing to a lack of time, and the next item on the program was the presentation of the

Report of Spinners' Committee.

which was made by Carl R. Harris, chairman, of Lancaster, S. C. Mr. Harris' report follows:

"I will make my report of the spinners' sectional meetings which have been held as concise as the subjects discussed will allow. This is a summary of all the meetings we have had.

"First let me state for the benefit of those here who were unable to attend these meetings, that with the body of men represented and the growing willingness of each and every one to help the other fellow, we are bound to secure results in our work that have never been achieved heretofore.

"Uneven work holds as great a terror for the spinner as any other one thing, and the causes for this unevenness in numbers has been discussed very freely, with a category of reasons being given ranging from the opening room through the spinning.

"It seems to be generally conceded that the variation in staple of cotton and improper opening facilities is the cause of a great deal of our unevenness. However, as the spinners' sectional meetings must confine their discussions to problems in the spinning department, I will give you only the points discussed which cause this unevenness in the spinning room.

"Some few of the things are as follows: Rolls not being properly oiled and cleaned, steel roll worn at the neck giving a variable distance between the 1st and 2nd rolls; stands worn which will produce the same results and neb bars being worn allowing one end of the top roll to come out farther than other end.

"For the information of mills which are operating old spinning frames I would strongly advise them to adopt a method which several mills have, to put their neb bars in first class shape. This was done with a special machine they rigged up, to run all the neb bars through, which left them as accurate as if they had been run through a milling machine. This greatly improved the running of the spinning. Time will not allow me to go into further details concerning this machine here, but any spinners who are interested can get full information by writing me.

"I hardly think it necessary to say to any good spinner that the uniform covering of rolls is an important item in eliminating uneven work, however, as many of us sometimes neglect things we know should be done I merely mention this as a reminder.

"Weight levers are one of the most important things to be watched on a spinning frame in order to get the best work. I have known of cases where the weight lever, stirrup and lever screw, had grooves worn into them until you could drop the weight, and the end would not come down. It is also important that the weight levers be set level.

"We have had considerable discussion in an attempt to

determine the degree of humidity which would give the best running work with the least variation, but owing to the opinions being somewhat divided we were unable to secure any definite information.

"We are very anxious to go into the humidity problem further at our next meeting, so please keep this in mind and be prepared to give us all the information you can.

"Another point which was brought out at one of the meetings was that the practice of sizing only a few bobbins at a time is very doubtful in its merits. Each member was requested to size every bobbin from the side of a frame and make a report of his variation. I have received a few of these reports, and the extreme variations run from 5 to 15 per cent and in some cases as high as 20 per cent. The variation is in the numbers and individual weights.

"We would like to recommend that every spinner here try this, if they have not already done so. Then go over the same frame and see that the spindles are oiled and none vibrating. Make all bands as near the same tension as possible by cutting off those that are slack. Remove any bobbins that are worn enough to be out of balance. Remove the worn rings and put on new travelers. If you have a new roll place it in, for if you will notice that if a roll has been running for a number of years, the flutes are worn slick on the front side. Set up your steel roll where worn at neck and stand so that the distance from the outside to outside of rolls will be the same. Put in new top rolls and adjust the neb bars so that the top roll is in line with the steel roll. Then adjust your weight levers all to the same angle and make sure that they are working freely.

"Gentlemen, that is only a start. We could take up all the time allowed us on this one thing, for there are just as many more things, as important as, if not more important, than the few we have mentioned. If you will give this frame your personal attention and see that these few suggestions are carried out correctly, then size the bobbins from this frame, I am confident that you will see that the variation in yarn can be greatly reduced in the spinning room and that it is not all caused in the card room. And when you have convinced yourself of this, teach your section man to put his frames in as near the same condition as possible, and then you will have the satisfaction of seeing those spare beams filled up with yarn.

"At one of our meetings the question was brought up: 'Will putting a tooth of twist in fine roving increase the breaking strength of the yarn coming from the spinning frame?' I wrote a number of spinners all over the country and at that time the consensus of opinion was about equally divided. The reports received at our last meeting indicated very clearly that the less the twist in roving, up to a certain point, not only increases the breaking strength but decreases the variation in numbers.

"But I want to ask this question for you to answer at our next sectional meeting. If the foregoing statement in regard to twist is true, why have the majority of mills got excessive twist in their speeder roving? This report has brought forth a volley of objections from some very able men, and I do believe this is one thing we should test fully, so that we may have a definite report at our next meeting. Somebody is wrong, so let us have enough reports on this to be positive which method is correct.

"In one of the questionnaires sent out the questions were asked: 'Which is the best method of running a traverse on 40s filling, up slow or down slow? Which method will best prevent the filling pulling off in bunches in the cloth?' At that time the preference was slightly in favor of running the traverse up slow and down fast. On further discussion at our last meeting it seemed to be generally conceded that this gives the best results. However, one or two were of the opposite opinion.

"On the new spinning frames which are being sent out the ring rail is geared to run faster than those on the old frames. Many mills equipped with old frames that have been having trouble with ropey filling are speeding up the rail and turning the cam around in order to run the rail down fast and up slow. This will prevent ropey filling; however, the speed should not be carried to excess or the work will not run quite as well.

"The discussions with reference to the merits of tape driven spinning, at our last and previous meetings, have proven to us that there is no comparison in the two drives. In all the discussions we have had, I do not recall a single instance where a man has had experience with the tape drive, but what he was strongly in favor of it, in fact enthusiastic over the advantages it has over the band drive.

"It was clearly brought out at one of our meetings that tapes do not wear out but come loose where they are sewed together, therefore, if some one can find a thread or method of putting the tape together which will last longer than our present method, this will of course increase the life of the tape. A few mills are experimenting with flax, different ply threads and metal fasteners in an effort to overcome this difficulty, but the reports are not in shape to give you at this time. I have reports from several mills showing the life of their tape to be from six to eight months, and bands from two to four months. These mills would like to know if they are getting the life that they should from their tapes and bands. Please give us a report on this at our next meeting.

"At Atlanta several stated that they were having trouble with the idler pulley bearings on the tape drive running dry and gumming. There may be others having this trouble, and for their benefit I will say that in the cases brought to our attention, it has been found that this trouble was overcome by taking the bearings out, soaking them in kerosene and removing all the old grease.

"In comparing the merits of the narrow gauge and wide gauge spinning, the opinion is that the wide gauge gives better running work and better yarn. Also the indications are that with the wide gauge we can get the same production on the same floor space on account of being able to get a greater front roll speed. I am a little inclined to be skeptical on this point and I want to make an appeal in behalf of the Association that every mill equipped with the two machines running on the same work, run a thorough test to determine this and give us the benefit of this knowledge.

"We took up the clutch spindle for further discussion at our last meeting and the benefits to be derived from it were expressed as follows: less waste from soft yarn, that it gave no trouble in upkeep, the yarn was easier to keep off the spindle, that it held the bobbin down, thereby making the work better, and some say that they get an appreciable increase in roll speed. This is about the same

opinion as was rendered at our Spartanburg and Atlanta meetings, so that the only added feature in its favor lay in the fact that more mills were using them and getting the results mentioned.

"In discussing the No. 1 and No. 2 flange rings previous to our last meeting, the merits in favor of the No. 1 flange were more or less a matter of conjecture, because the majority of members were just putting them on. Since that time they have had ample opportunity to test them fully and the points brought out in favor of the No. 1 flange were as follows: An increase in production ranging as high as 10 per cent in some cases; 15 to 25 per cent less ends down; and a considerable saving in travelers.

"I have reports from several mills on print cloth numbers of 30s and 40s giving their traveler supply bill. These reports show an average ranging from $1.68 to $6.00 per thousand spindles per year. This great variation proves that we must discuss the matter more fully We would like to have reports from others as these mills are anxious to know if they are within the bounds of reason.

"In our questionnaire sent out in 1919 the question was asked: 'What is the best distance to set guide wires from the top of the spindles on 30s warp?' At that time the majority were getting good results at 2¼ inches. Since then a number of mills have had their spindle rails raised from ½ to 1 inch. In most of the cases where this has been done they say the work runs better and they can use a lighter traveler. The distances reported show from 1¼ inches to 1¾ inches.

"The advantages of running filling wind on warp spinning was discussed very freely, and those using it said they were getting the following advantages: An increase in roll speed, more uniform yarn, and better breaking strength. The indications were that the only reason for this method not being universally used was on account of not having secured a satisfactory tension device for spooling.

"This, gentlemen, is a summary of the more important subjects which we have discussed at our sectional meetings. However, much of this information has been based on the judgment of the men, rather than on actual tests. In order to get this information into concrete form I want to suggest that every man who expects to attend our next sectional meeting take a copy of this report and test each one of these recommendations, or as many as you can, so that you will have a report to give us at our next meeting, one you will know is absolutely correct. If you will do this, it will not only be of great benefit to the mills, but will be a long step forward toward establishing standards for these different items."

"Thirsty Cotton"—A Moving Picture

On Friday evening, the delegates were given an opportunity of witnessing an industrial research moving picture film entitled "Thirsty Cotton," which showed the effect of moisture in the manufacture of cotton into yarn and cloth. This picture was the same as that shown in Washington during the recent convention of the American Cotton Manufacturers' Association in that city, where it attracted considerable interest and favorable comment from those who witnessed it there. On both occasions it was exhibited through the courtesy of the Parks-Cramer Company, of Fitchburg, Mass., and Charlotte, N. C., for whom it was prepared, and Thayer Francis, of the company's engineering department, was in charge of the presentation of the film.

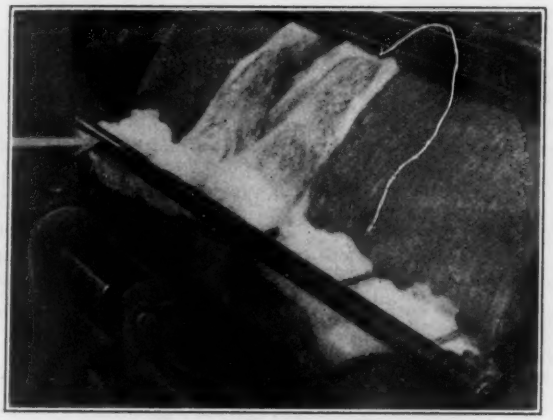
This film demonstrated the great possibilities of the moving picture in textile research work, and in its preparation and presentation, use was made of the natural ability of man to comprehend an explanation much better by a personal ocular witnessing than either by a verbal or written explanation of the subject. This psychological fact is assisted in this film by the use of the magnifying lens, the ultra-speed camera, which "slows down" the operation to one-eighth the actual speed, and the magnifying projector on the camera—all familiar features of the regular "movie"—which made it possible to illustrate the different processes in the mill in a manner easily perceptible to the man viewing the picture, giving him a clearer view of the operation than would be possible under actual operating conditions, although the operations recorded in the film were made under regular manufacturing conditions, the actual manufacturing speeds and conditions being maintained in all instances, the only change made being the amount of moisture surrounding the operations.

Before taking up the picture itself, perhaps a word describing the manner in which the views were made will present an idea of the conditions existing in the different scenes. The majority of the views were mill interiors. Those showing the contrasts were taken in the textile laboratory of one of the leading educational institutions of the country, on standard industrial machinery, operated by an expert operative. Good Georgia cotton, 1 and 1 1/16-inch staple, bought in the finished lap from a neighboring mill, was used, and the machinery was organized to spin No. 17s uncombed warp yarn from double roving with two processes of drawing and three of roving. The drafts, twists and tension were at all times subject to the eye of an expert and were changed to make the machines do their best even under bad conditions. At no time was any condition permitted to misrepresent or distort mill conditions. The combers were operated with laps made for the purpose from the drawing sliver, but no combed stock was used in any drawing, roving or spinning pictures. In fact, in all of the views, all conditions remained exactly the same except that of moisture—the main idea of the entire picture being to show a comparison or contrast in the conduct of cotton in process in a dry atmosphere and when the proper humidity conditions are provided.

Now for the picture. Preceding the presentation of the scenes, an explanation was given that baled cotton always contains natural moisture, which varies from 7 to 12½ per cent. During manufacture this natural moisture is lost if air lacks adequate humidity, and the finished yarn may contain only 4½ per cent regain. Adequate humidification restores this moisture step by step, and regain takes the place of loss. 8½ per cent regain is standard. Yarn at 4½ per cent means a loss of four pounds to the 100, 20 pounds to the bale. This loss is avoided by adequate humidification.

The scenes in the picture follow the cotton through each process in the mill, seriatim, beginning with the card room,

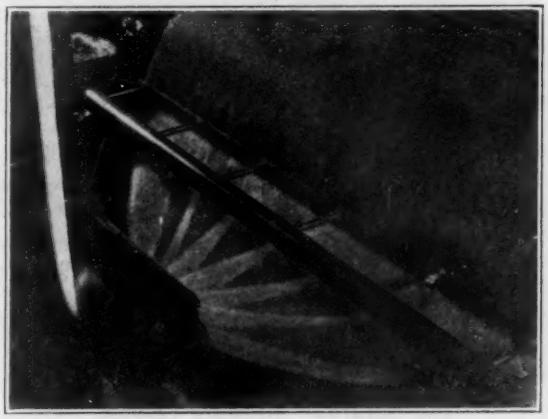
pointing out that the foundation of a good product is laid in this department, and that it is here that thirsty cotton begins to bristle its protest. First a view was shown of the front of a card operating under dry atmospheric conditions, where static electricity—the devil in dry cotton—was prevalent. This view showed the static electricity carrying the web up over the doffer comb, causing a decrease in carding capacity and the loss of good cotton as fly, lint and waste, simply because "the thirsty, brittle fiber can't stand the gaff." The next scene showed the same



CARDS HARD TO GET STARTED WITH DRY COTTON.

operation in an atmosphere containing the proper moisture, and the fiber, its thirst satiated, elastic, strong and workable, was shown coming off in a fine, even web. Demonstration was also made at this point that with proper humidity, the starting operation is much simpler, and even if the web is broken it falls into the pan.

Going to the next process, drawing, sub-titles on the

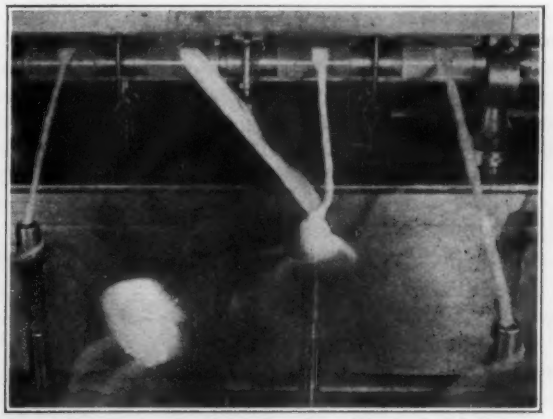


A FINE EVEN WEB WITH PROPER HUMIDITY.

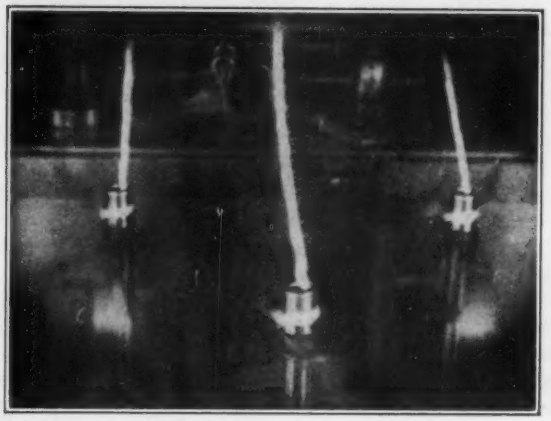
screen declared that in this operation, dry conditions increase tension, causing a ragged selvage and a fuzzy, spotty and uneven web. Views both at the back and at the front of a drawing frame operating in a dry atmosphere were shown, illustrating the sliver drawing unevenly, its weight changed and production interrupted by frequent breaks. In contrast to this the same operation under adequate moisture conditions was presented, showing the machine producing a web even in texture and weight, running smoothly and with the correct tension.

The combing operation was illustrated briefly, presenting a contrast between the appearance of a lap under dry conditions and the same lap under the right conditions, demonstrating clearly an improvement gained by proper moisture.

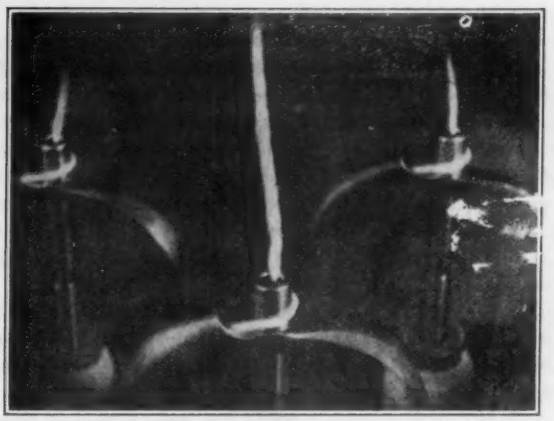
In the next operation, the slubber, where, it was pointed



LOSS OF PRODUCTION AND POOR PRODUCT WHEN DRY.



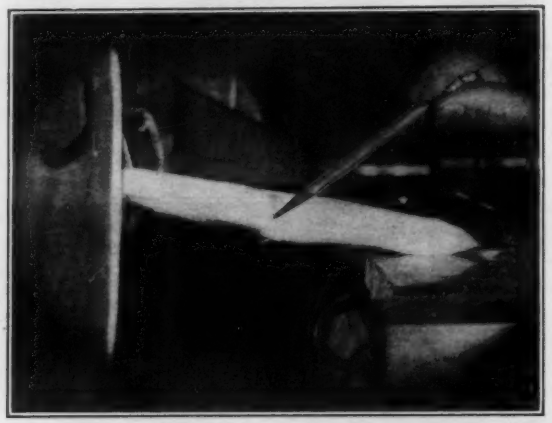
NOTE THE FLY UNDER DRY CONDITIONS.



STEADY PRODUCTION AND EVEN SLIVER WITH CORRECT HUMIDITY.

out, the sliver begins to undergo the first twisting and the drawing out process is continued, the first views showed the machine in operataion under dry conditions, and the utilization of the magnifying lens and projector and the

"slow-motion" camera at this point, gave the mill men an opportunity to see for the first time what had hitherto been only guessed at or deducted from the effects resulting from this operation. That is, while the machinery was operated at normal speed, the "slow-motion" camera, by slowing down the operation, gave the men the ability to actually see the lint and fly on the dry roving and see it come off of the roving as it enters the hollow leg of the flyer. It is true that in the mill, the flyers could be slowed down to eight or ten times less than the normal speed, which is the effect given in the picture, but the effect would not be secured in that the actual high speed is necessary to produce the conditions shown, and by really slowing down the machinery, this would be lost. It was brought out that the dryer the atmosphere, the more fuzzy the roving—the slacker the tension, the less the roving takes the



DRYNESS MEANS TENSION WHICH CAUSES BREAKS.

twist—and these conditions, well known to mill men through the results thereof, were actually shown on the screen. In contrast to this, views were shown of the same operation under adequate humidity, demonstrating that the bad conditions just illustrated were the result of static electricity and that with the right amount of moisture, "this devil is humbled, and smooth roving, even twist and steady production results."

In demonstrating the effect of moisture in the spinning room, another method of "trick photography" was brought into use; by means of "double exposure," a strand carded and spun under adequate conditions of moisture and one carded and spun under dry conditions were projected upon the screen, showing the former to be a very great improvement over the other in evenness, smoothness, etc., and a sub-title asked the following impressive question concerning the two: "Starting with card slivers of the same weight, which would you rather weave, knit or buy?"

In a search for the causes of the great difference in the two strands of yarn, a piece of dry sliver was shown in a testing machine, the machine was started, and it was shown that the fibers in this sliver parted from each other with very little resistance, while in a moist sample of sliver, shown in the next scene, there was a lively recoil in each fiber at the moment of parting, and this was impressively shown in the picture.

"Every break means a production loss in that process," said a sub-title, and "Every mended end means an imperfection in the next process." Then a warper was shown in operation where it was necessary to remove bunchy yarn caused by piecing at the spinning frame.

At this point an interesting test was recorded in the picture. A skein of dry warp yarn, 17s, was shown being put in an automatic yarn tester, and when the machine was started, the dry yarn broke when the indicator on the dial reached 84 pounds. Then another skein from the same bobbin, except that it had been moistened, was tested on the machine and the indicator went to 115 pounds before the yarn broke—a gain of 37 per cent in strength. A chart was then presented showing the breaking strength of yarn with relation to its regain.

Close-ups were shown in the weave room, where "strong yarn is essential to withstand the strain of shifting harnesses." It was declared that humidity maintains the strength of the yarn here, and that "A break means not only loss of production but a defect in the goods," and "seconds cost more than firsts."

At the conclusion of the picture, the following query was put to the men, "When adequate humidity (a) means a legitimate sale of moisture, (b) protects good fiber from breakage and loss while in process, and (c) insures more product from each pound of raw material—and each dollar of labor—why kick profits out of the shipping room door?"

PROPER HUMIDITY CONDITIONS RESULT IN PROPER TENSION.

"Thirsty cotton costs money. The difference between the accepted standard 8½ per cent regain and the average 4½ per cent regain is only 4 per cent," and the following table was shown on the screen to show what this means to a 10,000-bale mill.

Price of cotton per pound.	Loss per bale if finished product has only 4½ regain.	Loss per year to 10,000-bale mill.
25c	$4.00	$40,000
20s	3.00	30,000
15c	2.00	20,000
10c	1.00	10,000

The Saturday Morning Session

which was the final and business meeting of the convention, was called to order promptly at 9:30 o'clock by President Johnstone. It was announced that the report of the Master Mechanics' Division, S. B. Rhea, chairman, would be printed and distributed to members of the Association, but would not be presented at the meeting. The first report to be presented was that of the Weavers' Section, which was read by W. H. Gibson, Jr., of Union, S. C., the chairman of the committee, who said in part:

"As our subject is weaving, and a report of the weavers' meetings, we have such a wide field to discuss until I feel that it is useless at this time to try to bring out any

special points. However, there is always something to think about and something new to come up in weaving.

"The Southern Textile Association is the greatest organization of its kind in the world, and we feel that the sectional meetings have added tremendously to the benefits of the men and to the mills as well. I can remember years past when the Southern Textile Association was in its infancy, and it was a hard matter to get enough men together to get very much information on practical problems. However, it is a different story today. We find today whenever and wherever we have a sectional meeting, a large crowd of interested men who are eager and anxious to learn all they can in connection with manufacturing cloth, and when I say manufacturing cloth, I mean that this is one of the most important factors or processes there is in the textile mills today.

"Many mills may have excellent carding and spinning and even up to the point of slashing and weaving, and yet the results of the entire mill are crippled and ruined by lack of knowledge as to how to size yarn and to weave cloth. I feel that too much attention cannot be given to these two processes. It is imperative, however, to have good yarn to begin with, but even though you have the best of yarn, and poor slashing or poor management in the weave room, the mill is doomed for failure. I once heard the remark that the weave room is the banking end or the money end of any cotton mill, meaning by this that unless proper results were obtained from the weave room, all else would be lost.

"I have heard many comments from various overseers and superintendents concerning the information that they have gotten from these weavers' meetings. Some have gotten information from these meetings which resulted in the saving of thousands of dollars per year for their mill in the way of obtaining better results.

"We feel that these meetings, which are a part of the Southern Textile Association, have become a very important factor in learning first hand information that will produce results. Others, who have not learned materially specific points of interest at these meetings, have expressed themselves as being greatly impressed with the spirit of the meetings and have gone home filled with thoughts of their own and get better results than they had ever dreamed of. It has been said by some that, when the meeting was over, they were real anxious to get home and get to work for there were many things they could do which had not occurred to them before.

"I feel that there is no one person who can claim all the credit for the benefit of these meetings, but each and every one who participates in the discussion renders a great service to the meeting and to his fellowman by giving information to some fellow who needs it. Many times a thought is dropped that may not seem of any great importance, however it is these many little things that go to make up the entire textile industry.

"In conclusion I wish to say that we have seen a great deal of interest of late, and especially among weavers and superintendents, in putting out a better quality of cloth and to be able to compete in any market anywhere. We hope to see this work progress from time to time and keep the pace at which we are now going and not fall behind and let someone else take the lead."

Following Mr. Gibson came the

Report of F. Gordon Cobb, General Chairman of Sectional Committee Work.

Mr. Cobb prefaced his report by saying, "For the benefit of those who have not been attending our sectional meetings, I want to say that the sectional meetings are held at intervals between the semi-annual meetings, and the work we do at the sectional meetings is supposed to be compiled and reported at the semi-annual meetings of the Association. What we will try to do is to give you a brief report of the work that has been done, but before going into that, I want to take you back to 1917 when a paper was read here at Wrightsville Beach, on "A Plan for Better Technical Papers," and I want to read you only a few paragraphs from that paper:

"'If I understand the object of this Association,' read Mr. Cobb from the paper, 'it is first of all intended to make us more efficient overseers and superintendents. We do not seem to get the exchange of ideas at these meetings that we should.

"'Although the plan or idea I have to present is not worked out in detail, I hope I will give some of you food for thought so that we may get together and perfect a system whereby we can get away from the monotony of merely having one man's ideas expressed in a paper which is read at the meeting. There should be some plan which would give us the benefit of the knowledge of all the members, rather than hearing from a few.

"'My idea is that we as overseers, master mechanics and superintendents are seeking more light on the practical manufacturing problems. There are so many good men that we do not hear from at the meetings because many of them wait to be asked to present a paper and most of us do not like the idea of getting up before an audience.

"'Now an expert weaver, carder, spinner, cloth room man or master mechanic does not necessarily have to be a good speaker. In fact some of our most able overseers and superintendents never take part in these meetings more than listening to what the others have to say. Many of the mills are paying the expenses of their men who attend the meetings because they expect to learn something of bnefit to their jobs.

"'If the mills are taking that much interest, it does seem to me that we should make a special effort to give them value received for their money.

"'Is it not a fact that many of you know better ways of doing certain things which you have not mentioned at these meetings? Well, now, that is the thing I am after. We want those good ideas of yours. And remember, if you have a manufacturing secret you are jealously guarding. you can bring it here and "swap" it for a dozen just as good.

"'That is what the Southern Textile Association is for. That is what will make it a success. That is what will make us better men on our jobs. That is the thing which will make our employers glad to see us come to these meetings.

"'The unprecedented progress the southern mills have made in the last twenty years, I am confident, has been due more to our learning from each other than from any other one cause. We have long ago found out that a man does not lose anything by letting other men know what he is doing.

"'To make an illustration: If it had been possible to build a mill in the desert of Sahara twenty years ago, that

mill would be operating today on practically the same system with which it started. It would not have progressed. I imagine I can see in that mill the loom fixers going through the weave room on Saturday giving each weaver a broom to sweep up with, and I can see little bunches of weavers standing about talking, while their looms are also standing. Up in the spinning room I can see the band boy making bands by hand and the spooler girls tying chicken head knots, and in the card room I can see the old flat stripper pick up a flat and juggle it around a few times, then finally throw it out in the alley.

"'There are hundreds of old cards running in the South today on which the chains are worn out, and as the carder cannot get new chains for various reasons not necessary to explain, the flats begin to rub the stripping plates; that pushes the stripping plate into the cylinder and faces the clothing, with the result that the grinders have backed off the front stand to about a 20 gauge. That part of the card is doing more harm than good and also it is causing part of the web to be pulled back into the cylinder.

"'I know one superintendent who was making out an order for chains and sprockets to equip his cards when he chanced to hear of a man who knew how to fix the old ones. He adopted the idea and saved his mill over $900. That is the kind of dope we want to bring out at these meetings. We want things of benefit to our employers and things that will make ourselves better. Any spinner in this hall knows that if his work would run all the time like it does some days he could fill up every spare beam in the mill with yarn.

"'The Southern Textile Association was organized to get at the bottom of just such problems and we can do it if we get to work in the right way. I am going to offer as a suggestion that the president appoint a superintendent who has been overseer of carding as chairman of a committee on carding, and that all carders be automatically made members of that committee.

"'Have each carder write out a list of questions which will, if answered correctly, help him out of some trouble he is having in his room, such as tangled work, nitty sliver, having to put too much twist, etc. Then have him write down any original idea he has put into effect, such as a better way to work scavenger and roving waste or any improvement on any machine. (And right here I want to remind you that practically every mill in the last three years has adopted the same way of working scavenger and roving waste, as explained in one of our meetings.) Turn these papers over to his chairman. Then let the chairman of carding, with his sub-chairman, sift these papers down by eliminating duplicate questions, etc., and compile one report to be read at our next meeting.'

"That, gentlemen," said Mr. Cobb, "gives you a brief idea of what we started out to do five years ago, and the very able men who have followed me as your president have not only carried this plan forward, but have greatly improved upon it. Mr. H. H. Boyd successfully organized the sectional meetings and Mr. Johnstone has kept them going. Now they are considered the most practical and beneficial from a technical standpoint of any meetings held by any Association in existence. We have the only Association devoting the major part of its program to technical problems.

"To give you some idea of the interest mills have taken in the machine settings, standards, etc., we have discussed at sectional meetings, I have taken the trouble to bring along this cart-load of correspondence which has been received—since the last meeting—from mills scattered from Maine to Texas asking for more information, more details, etc., on the subjects we have discussed." Here Mr. Cobb exhibited a volumnious mass of correspondence on this subject, and read excerpts from one of the letters, written to him by the head of a large corporation which said, among other things, "The fact remains that we have materially increased our breaking strength after adopting the suggestions made at your last sectional meeting." "I shall be very glad to know what the other mills are doing on the subjects in hand, and to know the results of your further tests."

Mr. Cobb declared that the various sectional chairmen could show a mass of correspondence they have received from mills, and continued,

"The textile journals have overflowed with discussions in their technical departments seeking more light on sub-

A. L. CARTER, SECRETARY.

jects our sectional meetings have not fully completed. Their correspondents do not get through discussing one meeting before the next one is held.

"What I am trying to impress upon you is that we are progressing, we are improving in efficiency as overseers and superintendents, we are doing what the Southern Textile Association was organized for, and incidentally our employers are deriving more benefits from this work than they realize.

"A certain chain of mills reported they had saved enough waste to pay the superintendents' salary at every one of their mills by information received at our weavers' sectional meeting held in Greenville. A representative of another very large firm wrote me that he got more information out of our carders' meeting in Columbia than he had received in five years of his mill experience. A number of mills have increased front roll speeds on spinning as a result of the discussions on rings and spindle speeds and other items brought out at our sectional meeting of spinners. (The excellent paper that you heard yesterday

by Carl R. Harris is a compiled report of every item that has been taken up at all our sectional spinners' meetings.) One mill in particular had to install twisters to take care of the surplus yarn. That's more results.

"The machinery builders have practically adopted some of the standards which we have established at our sectional meetings. Beater speeds and beats per inch have been reduced in the great majority of mills with very beneficial results. There is no question but what we know more about picking machinery than we ever thought there was to know. We have proven beyond a doubt that most of the mills have not been equipped with enough preparatory machinery. It probably would be considered unethical, but I only wish I had the opportunity to relate the names of firms which have benefited by thousands of dollars as the result of Chairman Dilling's work.

"Back in 1919 our secretary reported to me that he could hardly collect enough dues to pay for having the minutes printed. Hoping to stimulate the payment of dues at our next meeting I sent a letter to the mill presidents appealing to them to let their men come to the next meeting. And with that letter I enclosed a list of questions that would be brought up and answered at our next meeting. I want to read you part of that letter in order to bring out a point:

> "'While having coal tests made at your mill to determine the cheapest coal to use, suppose your slashers are stopped during one test and running during the next. Do you think you will know which is the cheapest coal? Not likely. How much steam does a slasher consume in horsepower anyway? Hundreds of mills conduct coal tests without realizing the effect the slashers can have on such a test. There will be several other items concerning the practical side of coal tests which will be brought out at this meeting. Some one of the points which will be discussed might give your engineer food for thought.'

"Remember Chairman Rhea's valuable paper read since," asked Mr. Cobb. "Those of you who are interested in power problems would do well to look that paper up and study it for a week. Here's another letter I sent out:

> "'For the last few years experts on cards have been advocating a radical reduction in the pounds of cotton run through cards, claiming a resultant stronger, cleaner and more even yarn. Many mills which were built several years ago have tried to adopt this advice with the result that the reduction in card production has been brought about in numerous ways. In fact the method which suited the machinery for the individual plant best, was of course the one adopted. Have such mills gained or lost by fitting the new ideas to the old lay out of machinery? Superintendents and boss carders who attend this meeting will have the opportunity of knowing, etc.'

"Now the point I wish to bring out, gentlemen, is this: that every question in that letter and hundreds of others just as important have since been fully answered at our meetings. Isn't that showing some results?," asked Mr. Cobb. "In the face of all this evidence can it be possible that our employers will fail to give us the financial support that we need to form the foundation which is absolutely necessary to carry on this work?

"In England a group of mills will have a research bureau and they pay a small fee of a few dollars per thousand spindles to carry this work on. With the start we have made in the Southern Textile Association, if our employers would back us up we would soon be recognized as the most efficient overseers and superintendents in the textile world.

"The mills have called for so much information on the work that we have done that the sectional chairman and myself have been swamped with more work than it is possible for us to do. I see several men in this house who have asked for information that I have been unable to furnish because I simply could not get to all of them. It has been a physical impossibility for me to answer them all.

"But the one thing which has been most gratifying to me lately is that the northern commission houses are beginning to give us some credit for the quality of goods we are producing in the South. I have received letters from several sources in the last year acknowledging the superiority of goods made in the South and it has come out in several statements from prominent northern mill men recently. To glance over market quotations and see southern yarns and cloth quoted at a less price than goods made in New England has always been just like the proverbial thorn in the flesh to me. It makes me mad every time I see it. I want to go on record at this meeting by saying

JAMES D. HAMMETT.

that we as members of the Southern Textile Association won't stand for any such condition any longer, and we are going to work our heads off until southern goods will command a premium over any goods in the world.

"Just one more thought, Mr. President, and I am through. The art of spinning and weaving is one of the great arts which nature by means of instinct has taught mankind. It is so old that its origin has never been definitely traced. Savage races have practiced it from the beginning of time, and civilized nations have competed with each other in every conceivable way concerning its manufacture, until now it is recognized as one of the most valuable assets a nation can have. The nation, therefore, which excels in textiles will be a leading nation.

"There is a tremendous opportunity ahead of us. We must be big enough to grasp it. Ideas are the most valuable commodity of any industry. The Southern Textile Association is a clearing house for ideas. We have made a start,

and I want to make an urgent appeal to every member here to put your shoulder to the wheel in this valuable work so that we may carry on."

After Mr. Cobb's report, the chairman presented to the Association James D. Hammett, president of the Cotton Manufacturers' Association of South Carolina, past-president of the American Cotton Manufacturers' Association, and president of the Orr Cotton Mills, Anderson, S. C., and the Chiquola Mfg. Co., Honea Path, S. C., who addressed the meeting on the subject,

Character Building as an Essential to Happiness and Success in Industry.

"I certainly do feel very keenly the honor which you have given me," began Mr. Hammett, "and I wish to say that I have listened with a great deal of interest to the report read you by Mr. Cobb, and I heartily endorse everything that he has said to you. So far as the mills with which I am connected are concerned, we would be delighted to have our superintendents and all the overseers not only visit your sectional or departmental meetings, which are proving to be so interesting and pleasant, but we would be very much delighted to have them attend your semi-annual meetings and rub elbows with the various members of your Association and avail themselves of the opportunities offered by your organization, and in that way serve the mills in a more effective way and in a more unselfish spirit than can be possible where a man lives to himself alone." (This attitude on Mr. Hammett's part was borne out a few days after the meeting, when he sent a letter to all the members of the Cotton Manufacturers' Association of South Carolina, of which he is the president, urging the mill executives of that state to lend their support to the Southern Textile Association.)

"It would be stupid in me to come before an Association of men who have made a life study of carding, spinning and weaving, and who are experts in the various branches of textile manufacturing, and attempt to discuss the details of operation of a cotton mill. Stupid because each of you are more familiar with the subject than I can possibly be, and much more competent to advise as to the best procedure to follow in any given case where the manufacture of fabrics is considered. With that thought clearly in mind, and fully understood on my part, I have, through the kindness of your committee who permitted me to choose my own subject, elected to speak to you for a short time on the text 'Character Building as an Essential to Happiness and Success in Industry.'

"In taking a specific subject I am trusting to your usual spirit of charity, and feel that you will accord to me the same privilege you accord to your minister who takes a text and often never refers to it again during his discourse. Be that as it may, we shall undertake to talk a few minutes on this general subject which I regard as one of the most important confronting our people today, and one that is peculiarly applicable to the cotton mill industry and the happiness of those engaged in the industry.

"There are men of the highest standing and integrity and whose influence is very great because they possess unusual ability along certain lines, who maintain that sentiment has no place in business and that if sentiment be permitted to enter the portals of a business establishment success will be given a very severe blow. The question depends largely upon the definition of success. If success means the mere accumulation of wealth, there may be something in the theory; but to my way of thinking the accumulation of wealth is only one of the units entering into the true definition of success in industry. It is freely granted that the financial advancement is absolutely necessary, and that without financial advancement the other essentials to success become impossible. In the first place, the man or woman who invests the fruits of their industry in the building of industry has a perfect legal and moral right to a return on the investment that is in excess of the interest that may be had by investing in bonds and mortgages of the most approved type. This return should be so ample as to encourage the investor to take the risk that follows the investment of funds in a manufacturing plant whose success financially depends so largely upon the human equation. Of course, the general upkeep of the property is to be considered always as necessary and enters into the cost of production either directly or indirectly. The savings of the masses represent the wealth of the nation, and from this wealth, industry that furnishes honorable and lucrative employment to the men and women of the nation is created. Without an incentive to work there would be no work, and though fine spun theories are advanced from time to time which the advocates claim would eliminate the hard lot of the unfortunate, and place all on an equal financial footing, no practical plan has, as yet, been evolved that would eliminate the cold fact that work must be done or else mankind will starve. In fact, socialistic theories where tried have proved to be a failure and today the masses of the people of America, where most people work, are being solicited for funds to feed the starving of Soviet Russia.

"I am heartily in favor of welfare work, but I believe, without intention to criticise anyone, that welfare work can be carried to the extreme. I do not believe it wise to place before any people more than they deserve, and I believe if you are going about welfare work it is wise to start in a modest way."

In discussing the morals of the people in the southern cotton mill village, Mr. Hammett said, "A great many people are prone to criticise the mill people, but it has been my pleasure and privilege to live in the mill village and also in the so-called cities, and I unhesitatingly say that the moral character of the girls and women of the mill villages would compare very, very favorably with that of the young women in any other stage of society that you may find either North or South. I am not exaggerating when I say that fully 95 per cent of the girls and women in our mill villages are absolutely pure. The only drawback that I can see to the present age is that some of our parents—the men and women of our villages—permit their girls to go automobile riding at night with young men, unchaperoned. I may be an old fogy for my opposition to this, but I most heartily and earnestly condemn it, and I think it the duty of the members of this Association, who have a great influence in their communities, to discourage this idea on the part of young ladies going to ride at night with young men unchaperoned.

"We know our people, and we know that they are prone to criticise. If a young lady in the city is in the street, there is little said of it, but if one of our girls is in the street there are scores and scores of the men and women who take a great delight and pleasure in exaggerating the indiscretion of the young one, instead of helping them. This is wrong. It is a crime against the young one, and I believe it is the duty of the men who are leaders in their various communities to take a stand and hold up the hands of those who have not been so fortunate as to be led in the proper way, and if an individual has committed a wrong, try your best to smooth it over and call the attention of the one who has committed the wrong to his or her mistake and help them in that way.

"I tell you that the criticism that has been brought against the mill people is to a very large extent due to the attitude of the mill people toward themselves, and unless you go out and hold up your heads you cannot expect others to respect you. My observation is that people in other lines of endeavor are willing to respect the mill people and they do respect them, but if you let five per cent of your people lead lives that are not honest, just, right and proper, your entire community will come out and condemn publicly what the five per cent have done, creating the impression in the minds of people generally that a very large percentage of your people are living lives that will not bear the light of day. Your people are not any worse than the others—my observation is that they are better, but if a few go wrong and your community rises up in their wrath and condemns that, you cannot by any means convince the majority of the good people of this country but what a larger percentage of our people are just as guilty as that one or two per cent.

"Contending that work is necessary to progress and well being, I also contend that work is essential to the happiness of the masses of the people, and that to induce people to work, an incentive to work and practice thrift must ever be before them. Society, so far back as history relates, has decreed that labor shall be rewarded, and from that reward industry has grown until today hundreds and thousands of men and women are employed in industry because the incentive to work and save was given to our forefathers and they, taking advantage of this opportunity offered them to work and save and invest the fruits of their labor in industry, gave to every man and woman of this period of development an opportunity to work and live, and the same incentive to save and invest and furnish employment to those who are to follow us as existed when the generations of the past furnished through the fruits of their efforts the opportunity for us to enjoy the opportunities set before us. I regard it a golden privilege to work and to practice thrift so as to provide for the present generation and furnish an equal or better life to the generations to come. Without work moral depravity will grow so as to be a menace to society and we will, because of idleness, become degraded in thought, word and deed to such an extent as to lose all self-respect, and the race will be doomed to extinction. The idle in the nation, regardless of the size of their bank rolls, are not respected in the hearts of the people. The wealthy bum or the poverty stricken bum are looked upon by the best thinkers as leeches drawing as best they may the life blood of the masses of the people, and should not receive the courtesy extended by society to the people who try to do something for themselves and for humanity.

"You may ask, what has all this to do with the subject under discussion? It has just this to do with it: Work is necessary to clean living and success, and clean living is necessary to happiness, and happiness is dependent on the character which you have built for yourself. Incentive to work is furnished by society in the shape of reward for labor, and the size of reward is dependent on the quantity and quality of the labor performed, and to be successful financially you must be willing and anxious to exert yourself and perform your duties in such a manner as to meet the approval of those who own the industry and who are willing to reward you as your efforts may justify the reward.

"Believing firmly in the theory that work is necessary and should be rewarded, yet I feel that success in industry carries with it much more than the mere accumulation of wealth, and is so interlocked with happiness that it is difficult to separate the two. If industry is operated with sentiment banished from its portals and the mere accumulation of wealth alone considered, I do not feel that industry has reached its true objective and that such success will not be of the pronounced type industry was intended to enjoy. Without a happy people surrounding industry we must look upon any success achieved as only temporary and must be ever ready to meet the forces of discontent which unhappiness brings to our doors.

"Answering your inquiry as to how happiness may be brought to the masses and success in industry assured, I unhesitatingly reply that building character which will uplift the human race, creating a feeling of responsibility for the present and future generations, together with an earnest effort on the part of all to create an air of moral responsibility to society will turn the trick. I have the honor and privilege to be speaking to a body of men representing the Southern Textile Association, and made up of superintendents and overseers of the mills and members of the allied industries located in the South, and I say to you with all the earnestness and candor within my power that no body of men on earth have greater opportunities to build character, to serve mankind in its truest and best direction than have you, and if you will take advantage of the opportunities that are at your doors you can, in my judgment, do more to create a moral atmosphere, encourage thrift among the people you are chosen to direct, and through them influence the entire southland in such a way as to make it a model from which other sections of this nation and other nations may copy to their own good and the good of humanity. Because of your position and the influence you can exert in your several communities, you can continue the work of character building, so worthily commenced by those preceding you, as to make your name go down in history as one of the greatest bodies of humanitarians that history will ever record. Eliminating the great characters of the Holy Book, it is well that you think for a moment of that great body of men who, by word and deed, truly sowed the seed of character in the masses following them—Martin Luther and John Wesley did more than build character from a material standpoint, they built a spiritual character among the masses that has permitted the Christian religion to be embraced and loved by the thousands and hundreds of thousands that have followed them.

"George Washington, through his truthfulness, integrity and self-sacrificing devotion to the people, justly earned the title of 'father to his country.' Abraham Lincoln, a man of humble birth, because of his earnest devotion to the great cause of freedom and his disposition to be just to all, earned the reputation as a great builder of pure thought and worthy deed, and has his place in history as one of the great men of all time. Robert E. Lee, Stonewall Jackson —how glorious it is to have the privilege of repeating the names of these great heroes—recognized by the world, not only as the greatest military leaders, but as the greatest of great character builders of all time. William McKinley, Grover Cleveland, Theodore Roosevelt, Woodrow Wilson —great statesmen and great character builders, in that they attempted to influence men to travel the unselfish path of service to the race. Andrew Carnegie, who started life at work in a cotton mill at a more tender age than is permitted at this time, grew into the position of being the greatest steel manufacturer of his day, and from the fruits of his labor has endeavored to build character by planting in almost every hamlet in the land a well stocked library where the masses may improve their minds and characters by reading of the great characters of the past. Charles Schwab, the boy who, barefooted, held the horses of business men, soon attracted the attention of great financiers who placed him in the steel works where he grew to be the greatest manufacturer of steel of the age. Mr. Schwab is spending the fruits of his labor in assisting mankind to its highest ideals. Thomas Edison, the human dynamo, has worked incessantly to furnish the world those things that will make life more easy and has endeavored to build character by placing the opportunity before the masses of listening to the greatest melodies of the ages at a nominal cost. H. P. Hammett, Smyth, Montgomery, Holt, McAden and scores of others came along after the Civil War, and in order that impoverished but respectable men and women of the South should have the chance to follow an honorable calling which would furnish the means to a respectable living, established the groundwork, through great personal sacrifices, of the fifteen million spindles that are in operation in the South today. These pioneers were confronted with a limited capital, with practically no credit, and with an unjustifiable prejudice on the part of our own people against the mill operative. They succeeded because they worked incessantly to make the venture a paying one, and at the same time gave strict attention to the moral and social well-being of their employees. The employee thirty to forty years ago was a happy, free individual and the industry in which he was engaged was successful because the employee was happy.

"Permit me to call your attention to the career of J. C. Plonk. Mr. Plonk was not born of wealthy parents, and his educational advantages were exceedingly limited. He began earning his living at an age that would be looked upon by the present day theorist as a crime against the child. Mr. Plonk did not walk the village streets in idleness, but by industry and pronounced integrity, gradually worked his way, step by step, from the most insignificant position in the mill to the position as chief executive officer, and while so doing devoted himself to reading the classics until Mr. Plonk is one of the best read men in Carolina at this time. He has lived as one of us, and just a few days ago gave as a monument to his beloved wife a princely sum to one of the hospitals of North Carolina to be used as an aid to suffering humanity.

"While in the years gone by there was a prejudice against mill operatives, there is none today on the part of those who are informed as to the sterling worth of our people. They came from the same stock as do those who occupy the higher positions in our southland and character building has so rapidly progressed that we have today a very high type of citizenship in our mill communities. They are at times misled, but taking them as a whole the foreign-born disciple of distrust would find it difficult to lead them into an unreasonable attitude towards the industry they love. Much has been said recently about New England manufacturers moving South. I do not wish to be misunderstood for I have many friends in the North who are near and dear to me, yet candor requires me to say that if the New Englander wishes to come South and be one of us, leaving behind the objectionable element now constituting a large percentage of his employees, we shall give to him a cordial welcome, but if he is to come and encourage or tolerate the removal of that objectionable element that has little if anything to build on, we in all kindness and candor say that we hope he will not come into our midst and destroy the opportunity that is presented to you and me of building character on foundations that insure success and which will lead in the next generation or two to the finest citizenship it is God's pleasure to smile upon, provided you and I do our duty.

"The aftermath of the war has produced a feeling of unrest in people everywhere, and with it has grown an utter disregard of some of the laws, and a luke-warm feeling towards law as a whole. Whether we may believe in the principle of prohibition or whether we may believe in the legal sale of intoxicants, we must be honest and admit that while prohibition is not enforced as honestly as it might be, yet the drunkenness in our communities has been materially reduced and the comfort of the women and children of the community has been proportionately improved. If that be not enough to induce us to support the law with energy we should remember that it is the law of the land and that if our people learn to disregard one law they will soon learn to disregard all laws. As character builders we should note the improvement in the home life of many of our people and by precept and example support the law so long as it is the law of the land."

Here Mr. Hammett voiced a strong opposition to mob law. He told a story in which the late Theodore Roosevelt was quoted to have called the South Carolina people a "strong, virile, homicidal people." "We are a strong, virile, homicidal people," declared Mr. Hammett. "Our people have gotten to be a people who apparently are disregardful of the law of the land. If you and I do not take an interest and support the law of the land—and by that I mean not only the prohibition law, but all laws—then society is gone. Law was made and intended to be a protection to you and your wife and your children and the property you own, and if you do not exercise the privilege granted you to obey the law and force down mob law, then you have not done your duty. I do not hesitate to say that this mob law is moved to a very large extent by cowardice. A man will join himself with a mob and go out and do something to some poor, unprotected person that he would not

have the bravery to do by himself. I do hope that the members of this Association will exercise their privileges and their rights, and go back into their communities and endeavor to build up a sentiment that is not favorable to these things. If you bring a people to disregard one law, it follows that they will disregard all, and then chastity of the home, property, everything will be worthless and we will be led into a state of anarchy.

"As mill superintendents and overseers you come in daily contact with a large army of pure-born Americans, and your influence with them is such as to make of them, if you will, an irresponsible mob of indifferent characters, but if it be your will you may influence them and so build their character as to form them into an aggregation of happy, earnest, moral, thrifty fellows that will excite the envy of the whole world. You can, by just treatment and sound advice train their activities along paths of temperance, virtue, honesty and happiness, and in doing so make yourself the happiest man alive. Maybe you will not become internationally known, and maybe some of you will, but whether you do or not, you have the opportunity of leading your people into the happy well being that awaits all industrious and well behaving people. Ask your good wife to go with you into the social pleasures of your community, and if you do not have a wife, ask your neighbor's good wife and your neighbor—but be certain to also ask your neighbor—to go with you and make life pleasant for those who look to you for leadership. Don't confine your activities to the best dressed and more advanced girls of your community, but if you have the backward, the poorly clad in your community, pay especial attention to him or her, and encourage your best boys and girls to do so. Make social intercourse a part of your business, and if your people do not meet and enjoy themselves, prepare a place and encourage them to use it. You may be discouraged from time to time, but remember that the story of the Good Samaritan is one of the sweetest stories in the Holy Writ, and if you will occupy the position and stick to it, you will be a character builder that will bring happiness to yourself and to those influenced by you, and create an atmosphere of good will and good fellowship that will spread as the waves of the sea, and be the means of making our beloved southland in the mill village, on the farm, in the store, and in the home, the land of sweet contentment we should all wish it to be, and when you have accomplished the task assigned to you it will be a pleasure to look back and note that through your character building you have produced happiness, and through the happiness and contentment of your people, success in industry."

Mr. Hammett emphasized the necessity for the leaders in the mill village to live lives of cleanliness and cheerfulness as examples for the workers. "I do not care to criticise the hermit or the monk," he said, "who does nothing but pray and make self-sacrifice in his endeavor to serve God, but so far as I am concerned, give me the red-blooded fellow, the man who has a smile on his lips, the man who meets his fellow man face to face in an honest, earnest, sincere way—in this man you will have a superintendent or an overseer who is worth ten thousand times as much to the corporation and industry he serves as you will if you take the grouch and let him go around and have him despised by people who are not able to express their feelings, but who down in their hearts have nothing but a thorough contempt for him.

"When the boys and girls are sent away from home and enter college they are called upon justly to pay for the privilege of attending the school, and yet they grow to love the old buildings, the old campus, and the atmosphere surrounding them, and then in after years when the opportunity to 'root' for the old school is presented to the old boy, he is the greatest partisan and strongest advocate in the world. Why? Because he or she has been taught by the great character builders of the college, the superintendents and overseers, to love and reverence the old institution and to stand by it at all times, and well do they follow their teaching. You, as character builders in your communities, will find it possible to mould the characters of those within your sphere of influence so that they will be an honor to you and to the industry, and can encourage and mould the same character and loyalty to the great textile industry as does the faculty of the college mould the college boy into a loyal advocate of the college he attends. I leave it with you, and while sincerely thanking you for the opportunity of being with you, urge that you go to your several homes determined to eliminate selfishness, suspicion of your neighbor and indifference to the welfare of those not so fortunate as you, and devote a goodly percentage of your time in building character and producing happiness and loyalty and success to the great textile industry."

The address of Mr. Hammett was warmly applauded, and at its conclusion, President Johnstone said that in his opinion, "one of the reasons why in the period of reconstruction our help have been satisfied, without any disruption whatsoever, is that men of Mr. Hammett's character have brought this about in this section of our country." Later in the meeting, as an official expression of the Association's appreciation for his inspiring address, Mr. Hammett was unanimously elected an honorary life member of the organization. This honor had previously been bestowed upon the following men: Ceasar Cone, Captain Ellison A. Smyth, T. H. Rennie, O. Max Gardner and J. H. Separk.

At this point the report of Marshall Dilling, chairman of the Carders' Section, was presented by F. Gordon Cobb. Due to a lack of time at this session, it was voted that this report be accepted without reading and on motion was entered into the minutes of the convention. This was prepared in Mr. Dilling's usual able style, and consisted principally of a report of the carders' sectional meeting held in Charlotte, N. C., on February 24th, which was fully reported in the March, 1922, issue of COTTON.

Election of Officers.

The final feature of the convention was the selection of officers for the Association for the ensuing year, and the body went into executive business session for this purpose on Saturday morning. For President, John W. Clark, of West Durham, N. C., who has served as vice-president during the past year, was elected by acclamation. For Vice-President, James A. Chapman, Jr., of Inman, S. C., who has been chairman of the board of governors, was unanimously selected. The next office to be filled was that of the chairmanship of the board of governors, and when the convention was opened for nominations to this positon, Mr. Cobb said, "Mr. President, Mr. Marshall Dilling has served us as treasurer for about eight years, and also in his position as Chairman of the Carders' Section he has accomplished a great amount of good for the Association, and I do not think that any man is better fitted to hold

the position of chairman of the board of governors than he is, and I place his name in nomination for that office." Mr. Dilling was unanimously elected as chairman of the board of governors for the coming year.

The next office to be filled was that of secretary, and A. B. Carter was re-elected to this position, no other nominations being made. On motion of Milton G. Smith, T. A. Sizemore, of Greenville, S. C., was elected treasurer of the Association. Four new members of the board of governors were also selected, the following men being elected to the board as a result of this election: L. R. Gilbert, of Raleigh, N. C.; J. O. Edwards, of Lancaster, S. C.; O. D. Grimes, of Milstead, Ga.; and W. W. Greer, of Ware Shoals, S. C.

It was announced that the position of chairman of the carders' committee, made vacant by the election of Mr. Dilling as chairman of the board of governors, was an appointive office and that a selection would be made for this position by the new president at a later date.

Following the election of officers, John W. Fox, of Charlotte, one of the charter members of the Association made the presentation of the Association medal to Gordon A. Johnstone, the retiring president, Mr. Johnstone accepting this saying that "I came down South a stranger and this Association has always been one of the most pleasant associations of my life. You never will know how much this Association has meant to me, and as I retire from this office, remember that I shall carry on for the Southern Textile Association in all its endeavors and work."

David Clark, of Charlotte, was called upon for a statement in connection with the child labor law. Mr. Clark pointed out that with the Federal Child Labor Law recently invalidated, the child-labor agitators will be constantly on the alert, and any violation of the state laws will be magnified. He urged upon the men present to see that the state laws are kept strictly to the letter in their plants. Under the state laws at present in force, he explained, in North Carolina, no child under fourteen years of age can be employed, with the exception that a boy may be employed between the ages of 12 and 14, provided it is outside of a school term; in South Carolina, no child under 14 years of age can be employed; in Georgia, no child under 14½ years of age, with the exception of the child of a widowed mother; in Tennessee, the law is exactly the same as the recently invalidated Federal law; in Alabama, employment of any child under 14 years of age is not permitted.

It was unanimously voted to hold the next semi-annual meeting of the Association in Greenville, S. C., on October 20 and 21, concurrently with the Fifth Southern Textile Exposition which is to be held at Textile Hall in that city from October 18 to 25 inclusive.

Two navy blue colors have recently been brought out by E. I. du Pont de Nemours & Co., Inc. One, Sulfogene Navy Blue GL Conc., is recommended as a self color for producing full shades of navy blue with a bright greenish tone on all kinds of cotton goods and other vegetable fibers; Pontamine Navy Blue DB, the other new color, is a direct navy blue of good covering power, used for dyeing raw stock, yarns and pieces, either as a self-shade or in combinations for deep shades.

An Aspirator for Combers.

In order to keep cotton combers at their highest possible working efficiency, it is first of all necessary to have the chief working part of the comber, the needle segment, absolutely clean at all times; the needle segments are cleaned by the brush, and to have a clean needle segment, one needs a clean brush.

For this purpose, it is stated that the Roth aspirator, when applied to the comber, operates in an efficient manner, and, it is further pointed out, keeps the entire comber clean, so that three or four daily cleanings of the machine are entirely eliminated and making but one or two cleanings a week necessary. The working principle of the Roth aspirator is a patented feature and is very simple. Every individual head of the comber is enclosed by a hood made of sheet metal, and the front part of the hoods are connected to perforated cylinders, revolving at about one revolution per minute. These cylinders, which with the exception of the fan practically constitute the only moving parts of the apparatus, are connected by a short pipe to a fan placed underneath the headstock of the machine and driven by a small belt direct from the fly wheel. This fan creates in the perforated cylinders sufficient draft to draw the waste fibers off the brush direct onto the cylinders, a distance of about six inches, and the cylinders, in turn, deposit the waste in an open, fluffy state, into the usual waste receptacles. Thus, the waste, carried by the air current, travels only about six inches from the brush directly onto the perforated cylinder. Packing rolls, yieldingly held, hold the waste in the usual waste cans, so that a comber, working under average mill conditions, runs from ten to sixteen hours without having the waste taken out of the waste receptacles, it is asserted. However, this waste packing arrangement is made in such a way that the waste does not deteriorate in value, and may be used again without any additional opening process.

The simplicity of the moving parts of the device, the fact that waste is delivered in a state similar to that formerly produced by the use of the old doffer and doffing comb, are features of the device which, it is said, enable it to insure a better working comber and one consequently requiring less attendance and attention. Fewer breakdowns of the combed stock in the pans and less bunches in the roving are advanced as results of the ends of the detaching rolls being kept clean by the draft used to carry the waste and the specially designed hoods for each individual head of the comber.

The marked advance shown by the American chemical industry during the last few years is evidenced in a compilation of research chemicals prepared by Clarence J. West for the Committee on Research Chemicals of the American Chemical Society and the Research Information Service of the National Research Council, which has just been issued. A surprisingly large number of high grade chemicals now purchasable from American manufacturers are listed in this publication. The so-called "heavy chemicals," however, as well as practically all inorganic salts, have been omitted. The booklet is known as Number 35 of the Reprint and Circular Series of the National Research Council, and copies may be secured from the Research Information Service, National Research Council, Washington, D. C.

Popular Textile Chemistry

BY JAMES A. BRANEGAN.

PRESIDENT KALI MANUFACTURING CO., PHILADELPHIA.

The Manufacture of Coal Tar Dyes.

To most people the manufacture of a "Coal-Tar Dyestuff" is something mysterious and secret, when as a matter of fact it is a well defined process and in no way difficult to understand. The materials used are limited and the operations (called reactions in chemistry) are few in numbers, and it is by the combining and recombining of these materials and reactions that we reach the finished dye.

In the making of a coal-tar dye there are three very definite manufacturing steps.

1—Crudes (Raw materials).
2—Intermediates.
3—Finished dyes.

These are worked up by a few well known chemical reactions (operations), the more common of which are:

Distillation—By direct heat or steam.
Evaporation—Driving off water or other volatile solvents.
Chlorination—Saturating with free chlorine.
Sulphonation—Treating and combining with Sulphuric Acid, usually with high strength acid.
Nitration—Treating with Nitric Acid.
Oxidation—Adding oxygen, either from air or other chemicals.
Reduction—Taking away oxygen.
Diazotation—Treating with Nitrite of Soda and acid to add two atoms of Nitrogen (di-azo).
Crystallization—Allowing a concentrated solution to stand until pure crystals are formed.
Fusion—Heating a solid substance to a melting temperature.

Crudes.

In the manufacture of coke by destructive distillation a by-product, coal-tar liquor, is recovered and from this coal-tar we get, by distillation, the raw materials (crudes) much used in making coal-tar dyestuffs. The principal crudes are Benzol, Toluol, Phenol, Naphthalene, Xylene, and Anthracene.

These "Crudes" are treated by one or more of the processes mentioned above which converts them into "Intermediates." For instance, Benzol a crude, is treated with Nitric and Sulphuric Acids (*Nitration*) and then heated with iron filings (*Reduction*), which converts the "Crude" Benzol into the "Intermediate" Aniline Oil. If the "Crude" Toluol is run through the same processes we have the "Intermediate" Toluidine, and Naphthalene becomes Naphthylamine. Other combinations produce the "Intermediates" Alpha Napthol, Beta Napthol, Benzaldehyde, and Benzidine, all common "Intermediates."

The common "Crudes" are not more than six in number, in fact, most dyes are produced from either Benzol, Toluol, Phenol, or Naphthalene. Of the "Intermediates" less than fifty are in common use. The most important "Intermediate" is Aniline Oil, after which comes Toluidine, Benzidine, Naphthylamine, Alpha and Beta Napthol, Metaphenylenediamine, Paraphenylenediamine, Diphenylamine, and Salicylic Acid.

In order to describe clearly the manufacture of a synthetic coal-tar dye we have selected Methylene Blue, not only because of it being a very common dyestuff and familiar to all dyers, but also because, with the exception of Sodium Thiosulphate (Hypo), the manufacture of all the chemicals involved in the process have been described in these articles. The materials used are as follows:

1. Methyl (Wood) Alcohol.
2. Aniline Oil ("Intermediate" from the "Crude" Benzol).
3. Sodium Chloride (Common Salt).
4. Sodium Nitrite.
5. Sodium Thiosulphate (Hyposulphite of Soda).
6. Potassium Bichromate.
7. Hydrochloric (Muriatic) Acid.
8. Sulphuric Acid (Oil of Vitriol).
9. Nitric Acid.
10. Zinc Dust (Metallic Zinc in dust form).
11. Iron Filings (small particles of metallic iron).

We start with the "Crude" Benzol which is nitrated in a heavy nitrating kettle by treating with a mixture of Nitric and Sulphuric Acid. After getting rid of the excess acids this nitrated Benzol (Nitro-Benzol) is *reduced* by heating with iron filings and the "Intermediate" Aniline Oil is *distilled* off.

The next step is the manufacture of Dimethylaniline, which literally means two Methyl (Wood) Alcohol groups attached to one aniline molecule. For this purpose Aniline Oil, Aniline Hydrochloride (a mixture of Aniline Oil and Muriatic Acid, commonly called Aniline Salt) and Methyl Alcohol are mixed together and *heated* in a heavy cast-iron closed pot, called an auto-clave, until the temperature reaches 230 degrees to 270 degrees centigrade, at which temperature the Dimethylaniline forms.

We then proceed to *diazotize* the Dimethylaniline by dissolving 25 pounds in a mixture of 100 pounds of water and 130 pounds of concentrated Hydrochloric (Muriatic) Acid. This mixture can be made in a wooden tank provided with a mechanical stirer. The mixture is then *cooled* with ice and stirred slowly while a solution of 15 pounds of Sodium Nitrite is run in slowly through a tube which dips below the surface of the liquid. Care must be taken not to allow the temperature to rise above 15 degrees Centigrade (60 degrees Fahrenheit). The stirring is continued until the reaction is complete. This diazo compound, called Nitrosodimethylaniline is then *reduced* by slowly and carefully adding 40 pounds of zinc dust. The *reduction* is complete when the solution is a clear red color. At this point a test is made to learn if sufficient zinc dust has been added to *neutralize* all the Hydrochloric Acid. This test is extremely simple, all that is necessary is to place a few drops of the solution on a small strip of Congo Red test paper and if it does not turn blue all the acid has been killed by the zinc. If the paper turns blue more zinc is added.

The solution is diluted with water and a solution of 15

pounds of fresh Diemethylaniline mixed with Hydrochloric Acid is added. This mixture is well stirred and a solution of 50 pounds of Sodium Thiosulphate (Hypo) dissolved in water, is poured in and stirred.

The resulting mixture is *oxidized* by adding Potassium Bichromate and boiling for several hours. Sulphuric Acid and water are now added and the solution *boiled* to expel the gas which forms. This gas is Sulphur Dioxide (SO_2) and is set free from the Hypo.

The resulting solution from the chrome and acid is called the lenco base of Methylene Blue and this is again *oxidized* with neutral sodium chromate dissolved in water. The dye is then *precipitated* by adding common salt, and filtered off. This is the impure dye and it is *dissolved* in boiling water made acid with Hydrochloric (Muriatic) Acid and again precipitated with salt. This precipitate, which is the pure dye, is filtered, dried and powdered.

Dimethylaniline is used as a starting point for many other colors besides Methylene Blue, and the dyestuff manufacturers carry large quantities in storage. The complete operation as outlined above is not all done at one time. They consider the operation of treating the Dimethylaniline with Nitrite of Soda and Hydrochloric Acid as the actual starting point for making Methylene Blue.

If Methylene Green is desired the process is simply carried a step further and the methylene blue is *oxidized* with Nitric Acid which yields the familiar green dye.

The foregoing is a rather long process and the writer used it purposely in order to show the various operations, which are in "italics." It will be noted that all the operations are extremely simple and only need careful attention. Probably the most important scientific instrument needed is the common thermometer.

Some dyes are extremely simple in their manufacture. Induline for instance is simply a mixture of Aniline Oil and Aniline Salt *heated* for many hours at high temperature. (By varying the temperature we get the red or blue shades as desired.) The resulting melt is acidfied with Hydrochloric Acid and dried. This gives us spirit soluble Induline. If the water-soluble is desired the above is *sulphonated* with sulphuric Acid, then *neutralized* with Caustic Soda, *evaporated*, dried and powdered. This simple process yields water-soluble Induline which parades under various trade names, usually starting with "Fast Blue" and a letter following. It is much used in dyeing wool and silk, particularly foulards.

The great variety of coal-tar dyes can be readily understood if the reader can imagine the "Crude" (Benzol for instance) as the trunk of a great -tree, the principal branches are the "Intermediates" and the leaves and smaller branches are the "Dyestuffs." By constructing a tree for each "Crude" with branches for the "Intermediates" and leaves for the dyestuffs we finally have a small cluster of trees, the foliage of which represents all the finished coal-tar products.

One of the difficulties this country encountered in the effort of quickly putting coal-tar dyestuffs on the market, was the fact that in the making of quite a few dyes, various pharmaceutical and other products were produced at the same time. These various by-products or split-offs had to be marketed or the cost price of the dye would be prohibitive, and while there was a big market for the dyes the market for the split-offs was unknown and had to be located and some dyestuffs were held back for this reason. Foreign countries built up the dyestuff industry slowly and developed their markets for other products as the operations progressed.

When the reader who has had no training in Organic Chemistry runs across technical printed matter on dyestuffs or coal-tar products, he is usually puzzled by two characteristics which appear beyond his comprehension. The first is the mysterious looking symbols of the formula with its many hexagon rings and the other is the long and apparently unpronounceable names. The first of these characteristics, the "benzene ring" I explained under "The Manufacture of Aniline Oil" in the December issue of COTTON, while the long names are really very simple when understood and much more explanatory than short names which tell nothing. For instance, Methyl Orange or Common Orange 00 is the Sodium Salt of Diemthylamidoazobenzenesulphonic Acid. Sounds terrible, but it isn't when we analyze it as follows:

Di—Latin prefix for two.

Methyl—radical of wood (methyl) alcohol.

Amido—organic chemical name for ammonia in combination with something else.

Azo—From the French for Nitrogen (Azote).

Benzene—Benzene (Benzol).

Sulphonic Acid—Treated with Sulphuric Acid.

Sodium Salt—precipitated with Common Salt or Caustic Soda

All of which tells at a glance that the dyestuff contains two Methyl Alcohol groups, combined with groups of Ammonia, Nitrogen, and Benzene, all of which were treated (sulphonated) with Sulphuric Acid and precipitated with Salt or Caustic Soda. By this system water would be called *di-hydrogen-oxide*, meaning two atoms of Hydrogen and one atom of Oxygen (H_2O) which certainly tells us more than the meaningless word "water."

The reason we have these long descriptive names in organic coal-tar chemistry is due to the fact that about the time coal-tar chemistry was discovered we also developed a system of expression, while inorganic chemistry which developed slowly over a period of hundreds of years had all its compounds named before a system of giving explanatory names was developed.

[This article concludes the series on Popular Textile Chemistry by Mr. Branegan. However, we are pleased to announce that he has a new series on a closely related subject now in the course of preparation.—The Editors.]

The 1922 "Year Book and Cotton Manufacturers' Manual of the National Association of Cotton Manufacturers" has been issued. The year book contains the charter, constitution and by-laws and names of members of the Association. The "Cotton Manufacturers' Manual," which follows the year book section in the volume, was, as in previous years, compiled by Alston H. Garside, and represents the last statistical work of Mr. Garside for the Association prior to his leaving the organization some months ago. This section contains the usual valuable reference information, brought up-to-date, regarding cotton acreage, exports, comparative spindleage and loom figures, cotton consumption reports, and review of the industry during the past year, and other information of value and interest.

Vertical Openers in Triple Tandem.

BY P. D. H.

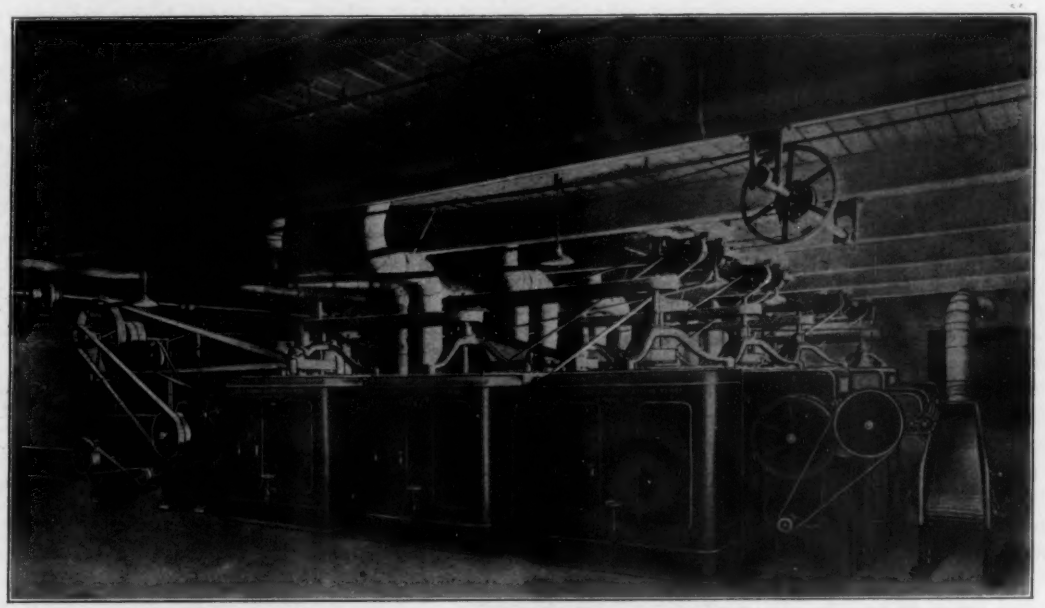
The recent revival of the vertical opener marks a new epoch in the development of the opening process in cotton manufacture. This type of machine was invented by William Fredrick Creighton in 1861.

The term "opener" as applied to this machine does not do it justice. It is also a "cleaner" with exceptional powers in removing sand, leaf, seeds and all loose dirt ordinarily found in cotton.

The opening and cleaning effect is obtained by passing the stock over a grid surface by means of steel picks or fingers attached to discs on the vertical shaft. The picks are bent to form a spiral from bottom to top and are slightly twisted to produce a lifting action. Stock enters at the bottom and is delivered at the top of the cylinder, the delivery being assisted by a fan which may be located some distance away, as when delivering to a condenser, or in the opener itself, as is the case when an apron delivery is used. There is no beating action and no possibility of fibers being injured. It removes leaf without breaking it up. The original machine enjoyed a short period of popularity and then because of an inherent mechanical defect —improper bearings—and also the lack of proper machinery for feeding, was considered by many to be impracticable.

The top bearing then consisted of a long vertical bushing from which it was impossible to keep oil from leaking and running down the shaft into the machine. The side pull of the belt, which tended to wear the bearing one sided, aggravated this condition. The vertical position of the cylinder made necessary the use of a step bearing to support the heavy vertical shaft. It usually consisted of a hardened steel plug in the base, a similar plug set in the end of the cylinder shaft, and a double convex washer of hardened steel between. As it was located in the center of the machine, it was directly in the path of sand and lint falling from the working chamber, and could neither be reached nor seen while the machine was running. In order to protect it from sand and keep it cool, it was encased in a water jacket fed from a reservoir at one corner of the machine. An oil reservoir was also provided to lubricate it. This bearing was a constant source of trouble and occasionally became hot enough to cause fires which spread to the machines following or to bins of opened cotton. The machine in the old form soon came to be regarded as too great a fire hazard and was in many cases discarded.

Before the invention of the hopper bale breaker, it was customary to place a small opener with a porcupine cylinder in front of the vertical opener. The cotton was fed directly from the bale to the apron of the opener and beaten either from the feed rolls or pedals. This beating of matted hard pressed cotton, while firmly held in the bite of the rolls, was very harsh and injurious to the fiber. The picks striking each inch of fiber several blows while held in this way also had a tendency to break up any leaf which was present and made its removal much more difficult. Furthermore the stock entered the vertical opener in such small tufts that the cylinder with its comparatively small number of picks could not operate upon it to the best advantage.



TRIPLE TANDEM ARRANGEMENT OF VERTICAL OPENERS WITH APRON DELIVERY.

The advent of the hopper bale breaker and the removal of the opening room from the picker house to the cotton store house, with the exhaust system of conveying, brought about a revolution in the opening process. The bale breaker took the cotton from the bale and loosened it sufficiently to allow the current of air to convey it to the condenser several hundred feet away whence it was distributed by a Morton distributor to bins or directly into the hoppers of the automatic feeders attached to the breaker lappers. The latter arrangement has proved to have many advantages over the older method and is now generally adopted wherever possible.

Realizing the benefits to be attained from a more thor-

ough opening and fluffing of the cotton before it entered the breakers, a well known firm of builders of cotton mill machinery began an investigation of the problem which led them to experiment with the vertical opener. It was seen that it was the ideal machine to fulfill the conditions, and their redesign of the machine to adapt it to the use of ball bearings proved successful in completely removing bearing troubles. The step bearing consists of a self-aligning radial ball bearing and a heavy type thrust ball bearing in a grease packed housing. The top bearing is a self-aligning radial ball bearing and is also set in a grease packed housing. Both bearings are provided with grease cups and require very little attention except to periodically fill the cups. As these bearings neither wear out of round nor leak oil, the pull of the belt does not affect them and the need of the balanced drive is done away with. The machines are equipped with two ball bearing idlers which permit the placing of the driving pulley at any height from the floor and at any angle to the direction of feed. This machine is fed by the bale breaker and delivers either into a conveying pipe or a screen section. Where more than one machine is used to deliver into the same system a screen section with apron delivery is attached to the vertical opener which drops the cotton on a feed table feeding into a conveying pipe, or a double feed table capable of feeding into either of two systems.

The value of the vertical opener in opening and aerating the cotton, with consequent improvement in the picking process following, was immediately recognized and the machine was installed in many opening rooms. For some time its cleaning power was not given serious consideration. After an extended investigation, these builders have recently developed, and applied for patents upon, a new type of adjustable grid bar which, it is claimed, has increased both the quantity and quality of the cleaning. It has been customary to use some form of perforated metal grid for ordinary cotton, and for long staple cotton, triangular grid bars so tapered as to allow equal spacing between them on the large diameter at top of the cylinder and on the small diameter at the bottom. The perforated metal limits the size of leaf taken out to the size of the perforations and is incapable of adjustment but for certain classes of work gives excellent results. The new type of grid bar is of uniform section throughout its length, of the same triangular form which has proved so satisfactory in lappers, and large enough to be easily adjusted and firmly held in place. There are 120 bars in four sections of 30 bars each with equal spaces between so that 15 bars run off the elements of the cone in the direction of the rotation of the cylinder and 15 bars in the contrary direction. A tapered grid of perforated cast iron is placed between each section, allowing easy access to the cylinder without disturbing the bars. Means of adjustment are provided for each set of 15 bars and the bars are securely held in any desired position. In this way it is possible to obtain a differential adjustment, opening wide the first set which the cotton strikes on entering the machine and gradually closing the sets which follow.

In order to show the effect of opening and closing the bars upon the cleaning, a series of tests were run on Good Middling cotton with a cylinder speed of 880 r.p.m. and a rate of feed of 10,000 pounds per day. Six bales of cotton, totalling 2,850 pounds were run on each test with the bars closed, half open, and wide open, with the following results:

Bars	Lbs. Cotton	Lbs. Droppings	Per Cent Droppings
Closed	2850	6	0.21
Half Open	2850	21	0.74
Open	2850	47	1.68

It is seen from the foregoing that the amount of droppings removed with the bars half open was 3½ times the amount with the bars closed, and with the bars wide open, nearly eight times the amount with the bars closed. The quality of the droppings was quite as remarkable as the quantity especially those from the bars wide open, which contained many large pieces of unbroken leaf.

With the evident possibility of removing two per cent of the most troublesome waste in the opening room without adding labor cost, the question arose as to the advisability of adding a second vertical opener in tandem, that is the first vertical delivering into a second thence to the pipe or screen section. The results obtained were so encouraging that it was decided to go one step further and place three machines in line making a triple vertical opener. Again the results were highly satisfactory, not only giving a good quantity and quality of waste in the third machine, but showing a marked improvement in the appearance of the yarn. It was found that the best results were obtained by varying the speed of the cylinders in the three machines 800 r.p.m. on the first, 600 on the second and 400 r.p.m. on the third. The reason for this is that the cotton entering the second machine is in a more open state with much of the sand and heavier impurities removed and the slower beater speed retards somewhat its passage over the grids. By the time it reaches the third machine, it has been still further aired and in consequence of its approaching the fan is under the influence of a more powerful draught.

The results obtained from a set of triple vertical openers over a period of three months, during which both perforated metal grids and the old type of grid bar were used are shown in the tables.

The stock run was a very low middling cotton.

Total cotton run—pounds	Dirt removed No. 1	Per cent dirt	Dirt removed No. 2	Per cent dirt	Dirt removed No. 3	Per cent dirt	Total dirt removed	Total per cent dirt
383225	6563	1.71	4597	1.19	2395	.62	13453	3.51

After the new type of grid bars were installed, a series of tests were run on Good Middling and on Low Middling cotton with the bars set wide open. The following table gives the results obtained:

Grade of Cotton	Total Cotton Run	No. 1	No. 2	No. 3	Total Waste	Per Cent
Good Middling..	5700	85	63	30	178	3.12
Good Middling..	5700	110	70	45	230	4.03
Low Middling ..	7600	165	130	97	392	5.16
Low Middling ..	5700	170	112	70	352	6.18

Half the droppings from the third test were run through a battery of four card and picker waste cleaners, the waste from each machine being kept separate, as shown below:

	Total	Reclaimed	Per Cent Reclaimed
No. 1 Vertical Opener	79	8	10.1
No. 2 Vertical Opener	65	6	9.2
No. 3 Vertical Opener	48	5	10.4

The fiber reclaimed representing 10 per cent of the droppings consisted so largely of short fiber, neps, and motes as to be of no spinning value. The most noticeable feature of the droppings was the great amount of leaf present in pieces from one-half inch to three-quarters of an inch in diameter, and the amount of motes and sand removed.

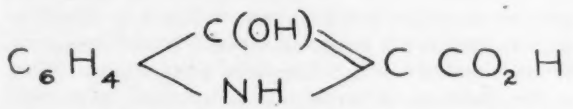
The results obtained from the tests described showed the benefits of the triple vertical opener so clearly that the mill where these experiments were conducted installed this arrangement on all six sets of their opening equipment.

Indigo

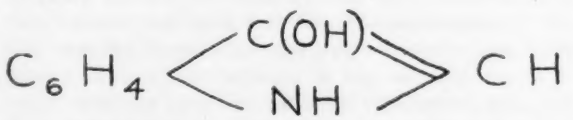
BY WILLIAM B. NANSON.

Synthetic Indigo.

The starting point for the manufacture of synthetic indigo is naphthalene, $C_{10}H_8$, which is oxidized, by heating with concentrated sulphuric acid in the presence of a little mercury to phthalic anhydride, $C_6H_4(CO)_2O$, which is then converted into ortho-aminobenzoic acid, $C_6H_4(NH_2)(CO_2H)$, by treatment with an alkaline hypochlorite. This acid is then condensed with monochloracetic acid to form phenylgly-cocoll-ortho-carboxylic acid, $C_6H_4(NH.CH_2.CO_2H)(CO_2H)$, which on being melted with a caustic alkali yields indoxylic acid,



and this readily loses carbon dioxide and passes over into indoxyl,



By alkaline oxidation indoxyl is converted into indigotin.

The number of different processes tried at various times for bringing about the conversion of the phenylglycine or its carboxylic acid into indoxylic acid, indoxyl and indigotin, are very numerous; a circumstance due to the fact that the efficiency of this operation controls the price of the synthetic indigo. Caustic soda has practically been given up, being replaced partly or wholly by caustic potash; in addition alkaline earths, sodamide, nitrides, alkali carbides, etc., have been used.

Synthetic indigo comes into the market chiefly in the form of a 20 per cent paste, but is also sold in the dry state in the form of a powder.

Indigotin, $C_{16}H_{10}N_2O_2$, is a derivative of indol and it can be prepared in an almost pure state by extracting good qualities of Bengal or Java indigo or synthetic indigo with boiling nitrobenzene, from which it crystallizes on cooling in dark blue crystals having a metallic sheen. When heated in an open vessel it readily volatilizes, yielding a violet vapor which condenses on cooling in the form of crystals. Indigotin is also soluble in boiling aniline oil, quinoline, glacial acetic acid and chloroform, but is insoluble in water, dilute acids, and alkalis and ordinary solvents like alcohol, ether, etc. By nitric acid and many other oxidizing agents it is readily converted into isatin $C_8H_5NO_2$. Heated with concentrated sulphuric acid it yields a disulphonic acid $C_{16}H_8N_2O_2(SO_3H)_2$, the sodium salt of which finds application as an acid color in wool dyeing under the name of indigo carmine. By the action of reducing agents, indigotin is converted into indigo white, $C_{16}H_{12}N_2O_2$, which is readily soluble in alkalis or milk of lime, with a yellow color. On exposing the alkaline solution to the air the indigo white is rapidly oxidized back into indigotin, and on these two reactions the application of indigo in dyeing and printing is based.

The old, but difficult and uncertain process of vat dyeing, necessary for the application of indigo, has been carefully studied by the factories which have taken up the production of synthetic indigo, and sodium hydrosulphite, long known to be the best means of reducing indigo in the vat, but unstable and difficult to prepare, has been brought into new forms in which it is quite stable and easily applied: - Thus vat dyeing has become an operation almost as easy and simple as any other process of dyeing, and the consumers of artificial coloring matters became anxious to be furnished with products similar to indigo in its mode of application and its fastness, but differing in shade. This wish has been satisfied almost as soon as expressed. A large and constantly increasing number of vat dyes of every conceivable shade has been offered to the dyer and calico printer, who is able to use them jointly or in mixtures with indigo and thus produce goods, the shades of which are as durable as the fiber itself. Some of these are known as "indigoid" dyestuffs, being similar to indigo in their constitution, but differing from it in certain details of composition and consequently also in their shades. Again, there are others which in their constitution have no similarity to indigo and the majority of which have been derived from anthraquinone, the mother substance of alizarin.

Dyeing With Synthetic Indigo.

Artificial indigo takes the most important position among the vat dyestuffs. Within the last few years it is replacing the natural product more and more, and unless the price of natural indigo can be reduced the time may not be so far distant when natural indigo will be little used.

The artificial product is identical with natural indigo, and, at least, as far as cotton is concerned, no difference can be detected between the behavior of the two products in the vat and both may be dyed by the same machinery and the same formulae. The varying composition of natural indigo is one of its serious disadvantages as compared with artificial indigo.

Synthetic indigo can be dyed the same as natural indigo by increasing the quantity of the indigo (figuring natural indigo as 60 per cent and synthetic as 20) in the copperas, the zinc-lime, the zinc-bisulphate-lime or the soda vat, just as given for the natural indigo vats in Part 2 of this series, so that it is not necessary for us to repeat the details here.

Hydrosulphites have been introduced which are still more stable than the ordinary home-made solution and are, therefore, more convenient to use, and I shall, therefore, advise their use in making up the vats for dyeing blue with artificial indigo.

Dyeing in the hydrosulphite vat is considerably simplified if reduced indigo, Indigo MLB Vat 11, is used in place of indigo or paste. A vat of about 800 gallons may be made up as follows: 120 pounds Indigo MLB Vat 11, 10 per cent; six gallons caustic soda lye (66.5 degrees Tw.); 7½ gallons hydrosulphite O.MLB. The indigo and the caustic soda are mixed with 15 gallons of water at 158 degrees F.

For yarn—prepare the bath with 180 to 220 gallons soft water, add four ounces hydrosulphite conc. powder, 1/5 pint caustic soda at 42 degrees Tw., one gallon of Turkey red oil and nine pounds common salt. One of the

following stock tubs is prepared and added to the foregoing:

(1) 24 pounds indigo solution, 20 per cent; seven gallons boiling water, two pints caustic soda 42 degrees Tw., two pounds 10 ounces hydrosulphite conc., two pints ammonia sp.gr. 936 (about 17 per cent).

(2) 5¼ pounds indigo pure powder I., nine gallons boiling water, 1½ gallons caustic soda 42 degrees Tw., 5¼ ounces hydrosulphite conc. powder, two pints ammonia.

The mixtures are allowed to stand for about one-half hour. Dyeing may be commenced as soon as the stock tub has been stirred into the vat. The vat should be of a yellow or a greenish-yellow color; if the liquid is dark green or blue it should be "sprung" with half a pound of hydrosulphite and half a pound of caustic soda 42 degrees Tw. per 200 gallons. The liquor should always smell slightly of ammonia. An addition to the vat of 1 to 2 pints of ammonia per day will be found sufficient if the vat is worked regularly. When strengthening the vat, one-half pound of common salt should be added along with each gallon from the stock tub, but if the dye liquor reaches the specific gravity of 9 degrees Tw. no more salt should be added. This common salt added to the vat makes the indigo go on to the fiber more quickly.

The hydrosulphite vat with ammonia gives a duller blue when dyed into light tints, but it gives a less coppery and clearer blue in the heavy shades than the other vats do. The special advantage of the ammonia vat when used upon yarn is that it has a less injurious action on the hands of the workmen. It forms no sediment, and the goods require no souring after dyeing. I would also say that in the case of piece goods this kind of a vat may be worked to dye the cloth on an ordinary jigger. Several points need careful attention in the application of indigo vat color, the most important of which are a perfect reduction and a uniform degree of alkalinity and temperature. The absence of these requirements is easily noticeable because the leuco solutions of the indigo are clear and yellow, and any shortage of either reducing agent or alkali or extreme variation of temperature usually gives a muddy appearance to the liquor. The process of reduction should be carried out gradually and the reducing agent added all at once; the temperature should be noted and kept as near constant as possible. The temperature should usually lie between 40 and 60 degrees C.

Printing Artificial Indigo.

The present application of the artificial indigo and other vat colors in the printing process depends upon the use of sodium formaldehyde sulphoxylate (hydrosulphite NF conc., Rongalite C, etc.). This is stable at ordinary temperatures and enables the color pastes to be made up without difficulty, and the prints from the machine are uniform throughout their length. On steaming, the sulphoxylate is liberated and at once reduces the dyestuff to its soluble condition in which state it readily combines with the fiber. After steaming, the material is treated with either soap or oxidizing agents which fully develop the color in an insoluble condition. This color is fast to light, washing and wear and will last as long as the fiber endures.

The distinguishing feature of the hydrosulphite process of indigo printing is the simultaneous application of the coloring matter, its reducing agent, and its alkaline solvent. The printing colors are very stable, as the reducing agent used has no action on indigo cold. The hydrosulphite process is no cheaper than the "glucose" process (described in Part 3), in fact the printing color itself is dearer, but it has the advantage that no preparation of the cloth is required before printing, and therefore the rate of production is increased and some economy effected in labor, time and steam by dispensing with the use of the "padding" and drying machines. Moreover, as all the essential elements of the color are mixed together in a staple paste, which only decomposes when subjected to a high temperature, the goods can be printed at any time without making any special arrangements.

Neither is the hydrosulphite process so dependent for success upon certain conditions of moisture and duration of steaming as is the glucose process. In fact, so long as the temperature of the steam is sufficiently high to bring about the decomposition of the hydrosulphite, the amount of moisture it contains and the length of time it is allowed to act may vary within comparatively wide limits without affecting the final result in any very great degree.

The steaming is carried out in specially constructed "hydrosulphite agers (see illustration in Part 3), which allows a temperature of 102 to 104 degrees Centigrade being attained. For light patterns the ordinary steam at 102 degrees Centigrade, and free from air, answers perfectly well; but heavy patterns require more moisture, and to supply this the ager is provided with a water trough inside, at the bottom. From the surface of the water aqueous vapor arises and renders the steam sufficiently humid. A printing color made up with hydrosulphite and the alkaline paste used for the glucose process is given below:

Dark Indigo Blue.

80 grams hydrosulphite conc. NF.,
420 grams alkaline thickening.

Dissolve this by heat and add.

150 grams 20 per cent Indigo L,
350 grams alkaline thickening.

The alkaline thickening is made as follows:

30 grams corn starch,
100 grams dark British gum,
870 grams caustic soda, 70 degrees Tw.

Mix carefully, heat to 140 degrees F., and then cool before using. After printing, steam two or three minutes at 102 degrees Centigrade in air-free moist steam. Then allow to cool and pass directly, in the full open width, into a continuous washing machine supplied with plenty of fresh, cold running water. Wash until all the alkali is eliminated, then sour, wash again, and finally soap wash and dry. The printed goods may be allowed to reoxidize in the air, but this is not necessary except for some heavy patterns printed in very deep colors.

This color gives a full navy blue when printed on white unprepared cloth. Lighter tints may be obtained by reducing it with various proportions of a reducing paste containing a little glycerin and about one-half of one per cent of hydrosulphite conc. NF (ML and B).

Reducing Paste (for light tints).

600 grams alkaline thickening,
300 grams 40 per cent Gum Senegal solution,
20 grams glycerin,
5 grams hydrosulphite conc. N.F.,
75 grams water.

Both Turkey red and paranitraniline red are easily discharged by the alkaline hydrosulphite color and in this

way the "red and blue" style can be produced perfectly by printing the blue upon previously dyed Turkey red and Para red goods. For Para red discharges, the quantity of the hydrosulphite must be increased from 12 to 20 per cent according to the depth of the engraving and the intensity of the red ground. For ordinary engraving and an average red the following indigo printing paste will give good results:

Indigo Blue (for Para Red).

120 grams hydrosulphite conc. (or hydraldite conc.).
100 grams water,
280 grams alkali thickening,
150 grams indigo L, 20 per cent,
350 grams alkaline thickening.

Print on Para red dyed cloth and after steaming, wash and soap as usual.

Turkey red is discharged by the alkali of the printing color and therefore does not require any extra hydrosulphite. Better results in every way are obtained when the cloth to be discharged is well soaped in an alkaline soap both before printing; or a solution of 10 to 15 grams of silicate of soda (without soap) will answer equally well. The only object is to remove surface color and fatty matters, both of which interfere with the proper action of the discharge agent on the actual ground color of the dyed piece.

On naphthol prepared cloth the brilliant insoluble azo colors can be printed along with the indigo and any other colors fixed in the same way such as the sulphide colors and other vat dyes.

The 20 per cent Indigo L paste referred to in the foregoing recipes is made by grinding together 200 grams Indigo L in powder (B.A.S.F) and 800 grams of a four per cent gum senegal solution.

Discharge Style.

In the discharge process which lends itself to a great variety of effects, the whole piece is first dyed to the required depth of blue in the vat and the color is then removed locally either by destroying it by means of oxidizing agents or by reducing it to the leuco-compound and removing this by means of boiling dilute alkali. The former process which is the one chiefly employed, consists in printing sodium chromate suitably thickened on the blue fabric. After printing the goods are run through a warm solution of sulphuric and oxalic acids, when in consequence of the liberation of chromic acid, the indigo is oxidized to isatin and this is removed in the subsequent washing, a white pattern on a blue ground resulting. For colored discharges, the chromate is mixed with albumen and a suitable pigment, such as vermilion or chrome yellow, and the goods are run, after being printed, through the mixture of acids at a temperature high enough to coagulate the albumen. The fixation of the pigment and the destruction of the indigo take place simultaneously. The process is capable of many modifications. Thus, in order to obtain a bright scarlet on a blue ground, the indigo dyed fabric is padded, first with an alkaline solution of B-napthol, dried and printed with a color containing diazotized p-nitraniline and sodium dichromate. The p-nitraniline (Para red) thus formed, resists the action of the chromic formed when the pieces are run through acid and a bright red on a blue ground results.

Indigo may also be discharged by printing on sodium nitrate and running the goods through warm sulphuric acid of 100 degrees Tw. (Freiberger's process.)

In the reduction discharge process, the pieces are printed with the formaldehyde compound of sodium sulphoxylate with or without the addition of a catalyst such as anthraquinone. They are then steamed in the rapid ager to reduce the indigo and immediately run through a boiling bath of caustic soda, soda ash, or silicate of soda. The indigo white is thus completely removed and there is no tendering of the discharged places, as is invariably the case when the chromate discharge is used. In place of sulphoxylates, titanous thioyanate may be used for this class of discharge.

The most valuable feature of the discharge process is that it allows of white and colored patterns to be produced on a *dyed* ground.

It is well known that it is possible to obtain by dyeing, a depth, fullness and richness of color unattainable by any process of printing. It is a very great advantage, therefore, to be able to print upon dyed cloth a substance which will discharge the color from the printed parts. But these discharge (or reserve) styles are not restricted to dyed goods only; they may be applied equally well to all sorts of *printed* patterns, so that it is possible to obtain a vast variety of effects on figured backgrounds. Any color that can be dyed and printed can be discharged irrespective of the method by which it has been applied, provided always that it is suitable to this class of work.

Another advantage, which relates more especially to discharge printing is that fine delicate patterns can be discharged on dark grounds with a perfection and crispness of definition quite impossible with a blotch roller. In the latter case the color always runs to a slight extent, and this, with delicate line or spot patterns, is almost invariably sufficient to spoil the sharpness of the impression; the color swells and fills up the finer details of the design. Some improvement may be effected in the impression of a blotch roller by using thicker color, but then the ground color suffers and is very apt to become thin and weak in appearance, or "clothy" or "bare" as it is called technically. On the whole, therefore, it is safer and better in all respects to employ the discharge method of printing when at all possible.

Discharging agents, unlike "resists," always act chemically and it may be noted here that both classes of bodies include oxidizing and reducing agents, acids and alkalis, and various salts.

(This is the fourth of a series of articles on this subject by Mr. Nanson. The fifth will appear in an early issue.—The Editor.)

The directors of the Textile Exhibitors' Association have announced that the next exposition of the Association will be held in Mechanics' Building, Boston, Mass., in October, 1923, the definite dates to be decided upon later. This announcement was made following the annual meeting of the organization, at which E. F. Hathaway, of the Shawmut Engineering Co., was re-elected president of the Association. Other officers elected were: F. J. Hale, of Saco-Lowell Shops, vice president; Chester I. Campbell, secretary-treasurer; directors, E. F. Hathaway, L. E. Tracy, of L. E. Tracy & Co.; C. A. Chase, of General Electric Co.; F. J. Hale, of Saco-Lowell Shops; P. M. Reynolds, of Scott & Williams Co.; F. H. Bishop, of Universal Winding Co.; George P. Erhard, of the Stafford Company; L. M. Keeler, of Whitin Machine Works, and Chester I. Campbell.

What the Southern Mills are Doing

Considerable new construction, improvement and enlargement work has been started in southern mill circles, and other plans have been revived and developed, during the past few weeks. This comes together with a notably increased feeling of brightness, both as to the present and future, in a large portion of the plants.

Notable among the construction work being planned is the new mill which, it is announced, will be built at Chattanooga, Tenn. The company formed for this purpose is known as the Dixie Spinning Mills, and the capitalization is given at $1,000,000. Negotiations have been completed for the purchase of an 850-acre site near Chattanooga, and a plant to cost about $400,000 will be erected. The mill will be built in units, each to contain 10,000 spindles, and it is planned that the completed mill will comprise 150,000 spindles. The buildings will be of mill construction and will embody the latest features of mill building. Approximately 200 houses for operatives are under way at the present. Those interested in this new project include J. T. Lupton, Carter Lupton, J. T. Harrison and J. F. Harrison, of Chattanooga. The product of the mill will be used by the Dixie Mercerizing Company, with which these gentlemen are connected, but it is understood that officially there is no connection between the two organizations.

Another announcement of interest is to the effect that stockholders of the Hawthorn Spinning Mills, at Clover, S. C., will build a new 20,000-spindle plant at that place to be known as the Hampshire Mills. The new mill will be capitalized at $1,000,000, and Thomas McConnell, of North Hampton, Mass., president of the Hawthorn Spinning Mills, will head the new company. Seventy acres of land have been purchased adjoining the present Hawthorne Mills plant, and the new mill, which will be a two-story structure, will be erected, and dwellings for operatives will also be constructed. J. E. Sirrine & Company, Greenville, S. C., are the architects and engineers. Mr. McConnell and John R. Hart, attorney for the mills, are promulgating the plans.

Ninety-Six Cotton Mills, Ninety-Six, S. C., have begun improvements which will include replacement of every dwelling house in the mill village with a modern bungalow, the erection of a new office building, a new school house, and a 4,000-bale cotton warehouse, and also the installation of a sewage system for the village. J. C. Self, of Greenwood, S. C., is president. Twenty carloads of large dimension terra-cotta pipe will be laid in improving the drainage of the village.

A 100 x 120 foot addition is being made to the plant of the Swift Spinning Mills, Columbus, Ga. The new building will provide additional warehouse and opener space. The building will be of modern standard mill construction; T. C. Thompson & Bro., Charlotte, N. C., are in charge of the work. The cost will be approximately $25,000.

Carlton Yarn Mills, Inc., is the name of a new spinning mill to be constructed by a company recently organized at Cherryville, N. C., by C. A. Rudisill and others. The capital stock is $200,000, and the officers are: Dr. L. L. Self, president; R. I. Dalton, vice-prseident; C. A. Rudisill, secretary and treasurer. Mr. Rudisill will have charge of the management of the mill. About 30 acres of land have been secured, and contracts for the main building and tenant houses have been let. It is understood the mill will have about 8,000 spindles.

Announcement has been made by the Riverside and Dan River Cotton Mills, Danville, Va., that a new bleachery will be built at Schoolfield. The building will cost around $450,000, and it is expected that it will be completed by the last of this year. Contract for the new building has been awarded, it is stated. The structure will be 300 by 145 feet, four stories high, of concrete construction. Bleaching and finishing machinery will be moved from other mill units of this organization, and the place thus made vacant will be filled with carding and spinning equipment.

The Pendleton Manufacturing Co., Autun, S. C., has been chartered with a capital of $100,000. A cotton goods mill will be erected, it is reported. The officers are E. N. Sittin, president and treasurer; C. M. Creitzberg, vice-president, and B. M. Aull, secretary.

The Carolina Power and Textile Company, Asheville, N. C., which recently filed application with the Federal Power Commission to develop 10,000 horsepower from streams in the Pisgah National Forest, by the construction of a large dam, will build a large cotton weaving mill at Asheville. The new company has made application for charter under the laws of Massachusetts and will have a capital stock of $400,000. Some of the stockholders are local people and others are located in New England, it is stated. Establishment of the mill is dependent upon the outcome of the application before the Commission for power rights, but it is not thought there will be any difficulty in obtaining permission for the use of government property and the construction of the dam.

The Jenckes Spinning Company, Gastonia, N. C., has awarded a contract for a three-story addition to its Loray Mill at Gastonia. The new space will be used entirely for twisting, weaving and finishing, adding substantially to the finished tire fabric production at this mill. A total of 42,000 feet of new floor space will be provided.

Shipment of machinery for the mill of the new Priscilla Spinning Company, Gastonia, N. C., has been ordered by J. H. Mayes, of Charlotte, president and treasurer. The company was organized in 1920. The machinery ordered out consists of 15,000 spindles for the manufacture of combed yarn.

On July 1st, the management of the Wateree Mills at Camden, S. C., and the Addison Mills at Edgefield, S. C., was returned to Henry P. Kendall, president and treasurer of the Lewis Manufacturing Company, Walpole, Mass. The announcement states that when these mills were bought by the Lewis Manufacturing Company in 1916 from Lockwood, Greene & Co., Mr. Kendall requested the latter company to manage the plants until the Lewis Company was properly organized to enter the field of cotton cloth manufacture, in addition to their regular business as bleachers and finishers. Report is to the effect that the Lewis Company has options on two other plants in South Carolina, and will consumate the purchase of these at an early date.

Merrimack Manufacturing Co., Huntsville, Ala., an-

nounce that plans have been drawn up for the installation of a $50,000 sewage system and the construction of 108 new houses at their plant. These village improvements will be made to provide for the contemplated $1,000,000 manufacturing plant announced recently.

It is understood that the Dwight Manufacturing Co., Alabama City, Ala., is preparing to build an addition to their No. 1 plant, for the purpose of installing 300 looms. According to unofficial information, the new mill will be 100 x 145 feet, and the addition of the proposed looms will make a total of 1,100 looms at these mills.

The Tifton Cotton Mills, Tifton, Ga., are putting $6,000 worth of new machinery in their card room.

The Cannon Manufacturing Co., Concord, N. C., are disposing of a number of looms in their plant to make room for an addition of carding equipment.

The Riverside and Dan River Cotton Mills, Danville, Va., has let contract for the building of a new schoolhouse in the village at Schoolfield, at a cost of approximately $50,000.

Abbeville (S. C.) Cotton Mills have formally opened their recently completed community house. The auditorium has a seating capacity for 500 people, and in the basement are two bowling alleys, pool rooms, shower baths and a barber shop.

The capital stock of the Whitney Manufacturing Co., Whitney, S. C., has been increased from $350,000 to $700,000.

The W. A. Handley Manufacturing Co., Roanoke, Ala., manufacturers of duck, have resumed operations after an idleness of about five months.

The Wellman Cotton Mill Company, Huntsville, Ala., has been formed with a capital stock of $200,000, and has purchased the plant of the Fulton Cotton Mills, Athens, Ala., which was recently sold in bankruptcy to bond holders. The mill has 10,000 spindles. W. M. Wellman, Shelby S. Fletcher and Robert E. Spragins, of Huntsville, compose the new corporation.

Saxapahaw (N. C.) Cotton Mills, are electrifying their plant throughout, including the water wheels. F. L. Williamson, of Burlington, N. C., is president. Holt-Granite Mills, Haw River, N. C., is doing similar improvement work.

The Steele, Nelson and Hudson Mills, Lenoir, N. C., are arranging for the electrification of the their equipment.

According to reliable reports, the capacity of the Boger & Crawford Spinning Mill, at Lincolnton, N. C., will be doubled in the near future. It is intended to increase the range of their combed yarn numbers. The present plant is operating day and night.

Athens (Ga.) Manufacturing Company are putting a large part of their equipment on indiviudal motor drive.

Machinery for the new Kilby Cotton Mill at the Alabama State Penitentiary, Montgomery, Ala., is being supplied by the H. & B. American Machine Company. The mill will contain 10,000 spindles, and will manufacture chambrays. It is understood the product will be handled by the Reliance Manufacturing Co., Chicago, Ill., who will make the goods up for the trade.

Details of the new mercerizing plant at Rutherfordton, N. C., have been announced. The company, organized with a $300,000 capital, is known as the Spinners' Processing Company. They will produce mercerized yarn by the warp mercerizing process, and will also include equipment for bleaching, dyeing and gassing yarn. The building, which will be of standard mill construction, will be 240 x 135 feet, two stories, and Potter and Shackelford, Greenville, are the contractors. The finishing machinery will be furnished by the Textile Finishing Machinery Co., Providence, R. I., Whitin quillers and Foster winders will be used, and the plant will have a capacity of 100,000 pounds of yarn a week.

In addition to the mill building, a large warehouse and 25 new mill houses will be constructed. A boiler house and caustic recovery plant will be built, two 300-hp. boilers to be installed. The production will be sold by the Johnston Mills Company, of Charlotte, N. C. C. W. Johnston is president of the Ruthefordton company, with R. F. Johnston as vice-president; S. E. Elmore, treasurer and K. S. Tanner, secretary.

The Maginnis Cotton Mills, New Orleans, La., are building a two-story brick and concrete mill building to cost $70,000. It is understood this will be used for dyeing and bleaching processes.

Ware Shoals Manufacturing Co., Ware Shoals, S. C., have awarded contract to Fiske-Carter Construction Company, Greenville, for building two additional stories on a 3-compartment warehouse, also new concrete warehouse platforms and chimney foundations. J. E. Sirrine & Company, Greenville, are the engineers.

It is reported the Linford Mills, Inc., and the Perfection Spinning Co., Belmont, N. C., are going ahead with construction and installation work. The mills will have a total of 33,000 spindles. The buildings are practically completed.

The China Grove (N. C.) Mills have also ordered machinery shipped and will purchase all accompanying equipment and supplies to put the plant in operation. The building has been completed.

Peerless Cotton Mills, Thomaston, Ga., will change about 50 looms over to individual motor drive, having secured 50 1-hp. motors from the Allis-Chalmers Mfg. Co., for that purpose.

The LaFayette (Ala.) Cotton Mill, recently purchased by the Skenandoah Cotton Co., Utica, N. Y., are preparing to install machinery and provide for larger operations. Power will be supplied by the Alabama Power Company, and Allis-Chalmers motors will be used to drive the machinery.

The Dixie Cotton Mills, LaGrange, Ga., will electrify their plant, 65 motors to be installed. Robert & Co., Atlanta, are the engineers.

The Hannah Pickett Mills, Rockingham, N. C., have recently purchased 600 hp. in induction motors from the Allis-Chalmers Mfg. Co.

The Southern Textile Social Workers' Association held its annual meeting at Gastonia, N. C., on June 15 and 16, and Charlotte, N. C., was selected as the meeting place for the Association's next annual convention. C. W. Coleman, of LaGrange, Ga., was elected president; Hollis Cobb, of Camden, S. C.; Miss Virginia Graham, of Henrietta, N. C., and Miss Margaret Sipple, of Columbia, S. C., vice-presidents. The secretary for the coming year will be Miss Marian Heiss, of Greensboro, N. C., who succeeds Miss Nell Pickens, of Gastonia; E. C. Carsen, of Columbia, S. C., was elected treasurer. The executive committee consists of the officers and E. B. Peck, of Spartanburg, S. C., Francis Widen, of Greer, S. C., and Mrs. M. Venable, of

Pacolet, S. C.

A two-story building, to be used as offices for the Armstrong chain of mills, is to be constructed at Gastonia, N. C. The building will be 30 x 100 feet, and will be erected by the Armstrong Land and Investment Company.

A new branch of the Viscose Company, manufacturers of artificial silk, has been started at Roanoke, Va. The company announces that by the end of the year its production will be increased by about 30 per cent. The new plant at Lewiston, Pa., is being operated, and the addition at Marcus Hook, Pa., now in course of erection, will be turning out fiber by September.

The New England Mill Situation.

The prolonged struggle between mills and their employees in New England is giving evidence now of an early end. The courts having been appealed to and hearings held, injunctions have been issued restraining unlawful picketing. Better protection is being afforded to those who want to work and some of the mills are being opened. In Rhode Island, where the trouble began in January, the folders of the Pontiac bleachery returned to work in a body at the 20 per cent reduction and under a 54-hour working week schedule. They had been working 48 hours.

This is regarded as one of the most significant defeats for labor in the long struggle as the union represents the best organized workers in the field and was looked after closely by the United Textile Workers. The latter claimed that a compromise settlement had been arrived at by which a 48-hour week was granted, but this was denied absolutely by the employers, B. B. & R. Knight, Inc. In other mills of this plant in the Pawtuxet Valley many disturbances occurred when two mills were opened but the workers are gradually returning. Some of the mills of the Lonsdale company are being opened now and some workers are returning.

In New Hampshire, the Amoskeag Company opened one mill and about a third of the operatives required in it have returned. This company recently bought the Stark mills owned by the International Cotton Mills, paying, it is reported, about $3,000,000 for the properties, and the goods in the looms are being run out by a few workers. The other mills of this company will be opened gradually as workers show signs of desiring to secure employment. It is fully expected that it may take two or three months to restore the conditions prevailing before the strike so far as the number of workers is concerned, and it will not surprise the management if some strikers remain until the snow flies. There is no great rush to open the mills as business is not very active nor very profitable at the moment.

In Nashua, Dover, and some other New Hampshire towns the workers are now returning slowly to the mills. Some disturbances are reported but on the whole the mills are slowly gaining. The Parkhill mills at Fitchburg, Mass., has been reopened and fully as many operatives are at work as the management requires at this time. This is another fine gingham mill. The New Bedford and Fall River manufacturers have taken no action looking toward reducing wages as yet. In Lawrence, the strikers are still out and the Pacific and the other mills are making little or no effort to force the issue.

In so far as the strike has gone the end is a victory for the mills but it is a victory that is unpopular. That is to say, public sentiment is still strongly with strikers and against the mill managements, a fact of unusual significance for the future of New England manufacturing.

It has been officially stated that the Stark brands on cotton duck, towelling, etc., will be retained, but a new mill will be built in the South to produce the goods. If an established plant can be bought at a satisfactory price it will be utilized. It is reported that the Pacific mills will take steps to establish a finishing plant of some kind in the South and will look toward that section for further expansion during the life of the present management.

The attitude of the public toward the New England industry is more disturbing to manufacturers and investors than the facts that enter into actual competition between plants located in this section and elsewhere. Taxation has become intolerable and it is in the hands of the public. Legislation of a restrictive character is being passed and urged constantly and this is a factor that is constantly crippling the possibilities of competition. Nothing is in sight at the moment to indicate that this attitude will change soon and for that reason, the sentiment is stronger in favor of investing elsewhere in new enterprises.

Manufacturers are less disposed to blame their operatives for the struggle that has gone on for months than they are to blame outside agitators and home reformers. While Massachusetts boasts the highest degree of culture in the country, this strike has shown that industry or those engaged in it are on the defensive. To a lesser degree this is true in New Hampshire and Rhode Island, and it is not true of Connecticut or Maine. But it is so general that some of the most active managers of cotton mills in the section are becoming outspoken against the policy of encouraging new mill investments under present conditions.

No textile strike in New England has evoked such violence over such a large field. In Rhode Island this month an almost successful attempt was made to blow up the Flat River dam in Coventry that supplies many mills, in the Pawtuxet valley. Had it succeeded it would have caused an overwhelming loss of life and property. It was again necessary to call out the militia. In Nashua attempts were made to burn the homes of those who returned to work. This action is plain anarchy but it has not aroused New England people as less menacing riots have in other years of textile struggles. Incidents of this sort have hardened many men in the business and led them to regard their own interests more selfishly. In some large centers of population the mills pay half or a third of the municipal taxes but that fact has been lost sight of.

Business has improved steadily in the past month in a moderate way. The rise in cotton stimulated buying of cloth and it was possible to move many stocks and to book some forward contracts. Fall River was a free seller on the rise and some other centers met the market to relieve themselves of stocks made from lower priced cotton and keep the mills employed. Curtailment of production throughout the district is still of a substantial character but it has been lessening steadily. The strike alone has taken more than a quarter of a billion yards of standard cotton goods out of the markets.

The measure of improvement seen thus far has been in the sale of goods. If profits were computed on actual producing costs at the time of sale the figures would show on the wrong side of the ledgers. Manufacturers are very

Barrett Specification Roofs

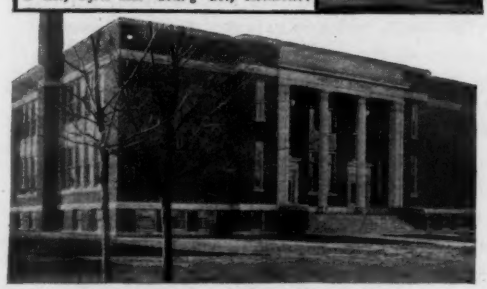
Bonded for 20 and 10 years

Barrett Specification 20-year Bonded Roof on First State Bank Building, Rochester, Minnesota. Arch.: F. H. Ellerbe, St. Paul, Minn. Cont.: G. Schwartz & Co., Rochester. Rfr.: Rochester Rfg. & Cor. Co.

Barrett Specification 20-year Bonded Roof on Kahler Hotel Bldg., Rochester, Minn. Arch.: F. H. Ellerbe, St. Paul, Minn. Cont.: G. Schwartz & Co., Rfr.: J. W. Gibson Co., Rochester.

Barrett Specification 20-year Bonded Roof on Worrell Hospital Building, Rochester, Minn. Arch.: F. H. Ellerbe, St. Paul, Minn. Cont.: G. Schwartz & Co., Rochester. Rfr.: Star Cont'g Co.

Barrett Specification 20-year Bonded Roof on Rochester Telephone Company's Building, Rochester, Minn. Arch.: Downs & Eads, Minneapolis, Minn. Cont.: G. Schwartz & Co., Rfr.: Star Cont'g Co., Rochester.



Barrett Specification 20-year Bonded Roof on Holmes School Building, Rochester, Minn. Arch.: F. H. Ellerbe, St. Paul, Minn. Cont.: Maske & Matzke, Rochester, Minn. Rfr.: J. W. Gibson Co., Rochester.

Barrett Specification 20-year Bonded Roof on Lincoln School Bldg., Rochester, Minn. Arch.: F. H. Ellerbe, St. Paul, Minn. Cont.: Maske & Matzke. Rfr.: J. W. Gibson Co., Rochester, Minn.

The Roofs of a Famous Small City—

When a small city is famous, it is usually because of its *past*

But Rochester, Minnesota, is famous because of its *present*. For in "Progressive Rochester" is located the Mayo Clinic, conducted by the world-renowned physicians and surgeons, Drs. William J. and Charles H. Mayo.

A reflection of Rochester's progressiveness is its modern and substantial hospitals, hotels, schools and commercial structures. Many of these buildings are roofed with Barrett Specification *Bonded* Roofs. The Bond absolutely protects the owner against all roof repair expense during the bonded period. It is proof that a Barrett Inspector has visited the job to see that the roof is properly laid and that the proper quantities of materials were used. It insures the long service at low cost for which these roofs are justly famous.

There are two types of Barrett Specification Bonded Roofs—Type "AA" bonded for 20 years; and Type "A," for 10 years.

Before specifying or closing contract for a Barrett Specification Bonded Roof, be sure to read carefully all the stipulations in the Specification.

Full details regarding these Bonded Roofs and copies of The Barrett Specifications sent free on request.

The Barrett Company

New York, Chicago, Philadelphia, Boston, St. Louis, Cleveland, Cincinnati, Pittsburgh
Detroit, New Orleans, Birmingham, Kansas City, Minneapolis, Dallas, Syracuse, Peoria
Atlanta, Duluth, Bangor, Salt Lake City, Washington, Johnstown, Lebanon, Youngstown
Milwaukee, Toledo, Columbus, Richmond, Latrobe, Bethlehem, Elizabeth, Buffalo
Baltimore, Omaha, Houston, Denver, Jacksonville

THE BARRETT COMPANY, Limited

Montreal, Toronto, Winnipeg, Vancouver, St. John, N. B., Halifax, N. S.

apprehensive of the future because of the cotton advances and the slow response in the cloth markets. On many goods prices are not relatively as good for the mills as they were when cotton was from 4 cents to 5 cents a pound cheaper. There is a sharp division of judgment among manufacturers as to the future course of the market.

Some feel that the purchasing power of the country is going to be measured by the low prices current for many of the grains and other farm food products. They do not think that the South will be benefited as a whole by high priced cotton although those who have cotton to sell will benefit from a short crop. Mills whose agents do business in the South say it is harder to sell cotton goods at higher prices there than in the West.

A large part of the business booked thus far has been with the manufacturing trades. The converters and jobbers have bought sparingly as a rule. There has been a substantial improvement in the goods used in corset making, rubberizing, and cutting for working suit purposes. The printers who are busy are admittedly running on a close margin of profit and they are not able to advance prices despite the long closing of the great Pacific print works. The bleachers have been selling more goods but at a profit margin incompatible with the replacement of gray goods made from 22-cent cotton.

The lack of plain fine combed yarn business is notable. Although staple cotton is much higher relatively, prices for goods of a plain character made from 60s warp and 90s filling have not shown a move upward so much as ¼ cent a yard. The fine goods mills are doing their best business on fancies and specialties and not on the staples for printing and general converting and bleaching.

It is estimated that only about 65 per cent of the capacity of fine goods production is active. Many mills are running full time with 40 per cent of the machinery unoccupied. There is no incentive as yet to pile up goods even from the limited supplies of low priced cotton in hand.

The knitting industry has been moderately active in this section. The business done has been on a close margin save in the mills making very high qualities of hosiery or underwear. The staple mills are said to be staggering along showing gradual but slow improvement.

There is a strong feeling at the present time that the resumption of work in gingham and napped goods mills will be so slow that no appreciable effect upon market prices will be seen for some time. It is evident enough now that if the prolonged strike had not taken place in New England gingham mills the gingham section of the market would be in a very grave state. It is none too good at the moment.

Reports come from machinery centers telling of brighter prospects for the coming Winter and for next year. Aside from the probability of investment in the South by New England interests there are reports current of a much larger expansion in the South by southern interests than is commonly believed in the trade. Some South and North Carolina developments that are in the preliminary stages give promise of eventuating into very great activity in machine shops. The latter have undergone a very considerable part of the liquidation of labor that was bound to follow the exalted wages of war time and are prepared to make attractive prices for those who really want to buy machinery and will not ask investment return in payment.

The finishing plants as a whole have been showing a little gain in the past month but much must yet be accomplished before there is work enough offered to keep all printers and bleachers busy. The dyers of very fine goods are quite busy.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, June 19, 1922.

Improvement in international economic conditions, rapidly decreasing stocks, due to heavy mill takings by the world and prospects for an inadequate supply for trade requirements next season, made apparent by the low condition of the crop and presence of weevil in large numbers in nearly all sections of the belt, occasioned a further advance of about 4 cents, or $20 per bale in the value of cotton, compared with one month ago.

The government reported 31,678,000 acres as having been planted to cotton last year, averaged the condition of the crop, as of May 25th at 69.6, and as private returns average the increase in acreage this year at about 7 per cent, the indicated yield this year pointed to only 10,811,000 bales.

Contrary to general expectations, domestic consumption during May in the U. S. this year was 548,000 bales vs. 489,000 last year, linters included; making the total for 10 months of the season 5,431,000 including linters, against 4,437,000 for corresponding time last season, indicating that American mills will consume about 6,527,000 during the whole of this season compared with 5,402,000 for the whole of last season.

The British Board of Trade report for the month of May made a very bullish showing also, exports of yarn having been 14,200,000 pounds vs. 8,500,000 last year, while exports of cloth totaled 443,000,000 yards against 146,000,000 one year ago.

Another constructive development was the lowering of the Bank of England discount rate from 4 to the pre-war level of 3½ per cent, which is expected to be followed by another reduction in the rediscount rate of the Federal Reserve Banks in the United States, all of which is in favor of further trade expansion on both sides of the Atlantic.

Meanwhile spinners of the world continue to take freely of American cotton, having taken 228,000 bales the past week vs. 130,000 last year, bringing the total since August 1st up to 11,465,000 bales against 9,156,000 to even date last year, or 2,309,000 in excess of so far last season when total takings for whole of last season were 10,500,000 bales, indicating that takings for the whole of this season will approximate 13,000,000 bales.

With British trade improving rapidly, and American consumption running much larger than last season in the face of the New England strike, there is the apparent need for at least 13,500,000 bales by the world next season. That being the case, it is interesting to predict what would result next season in the way of price levels in event of this year's crop proving to be not more than 11,000,000 bales. In this connection a prominent Liverpool house cabled the opinion that cotton would be sure to sell at 30 cents per pound, perhaps much higher, in event of this year's production being not more than 11,000,000 bales.

That the trade is threatened with the possibility of a

H & B AMERICAN MACHINE COMPANY

PAWTUCKET, R. I.

Southern Office : Atlanta Trust Co. Bldg. Atlanta, Ga.

Opening and Picking Machinery

Card Room Machinery

Spinning Machinery

Twisters for Wet or Dry Work

With Band or Tape Drive

COTTON MACHINERY

famine in American raw cotton next season unless 13,000,000 bales are made this year, the following deductions show:

	1922-23	1921-22
World's carry-over, Aug. 1st (est.)..	4.594,000	9,194,000
Crop indicated, linters included....	11,500,000	8,400,000
Total supply, visible and invisible (est.)	16,094,000	17,594,000
Spinners takings by world (est.) ..	13,500,000	13,000,000
Estimated carry-over by world, Aug. 1st	2,594,000	4,594,000

If the world's carry-over of American cotton is reduced to 2,594,000 bales on Aug. 1st, 1923, it would be the smallest, commensurate with trade requirements, since the American civil war, and would compare with about 4,594,000 at close of July this year; 9,194,000 last year; 6,216,000 year before last; 6,844,000 in 1919 and with 4,422,000 in 1918, which was the smallest during the world war.

Heavy damage by weevil is anticipated in July and August.

An International Cotton Congress, to bring together all branches of the cotton industry, will be held in Rio de Janeiro, Brazil, from the 10th to the 18th of October. This will be under the auspices of the National Society of Agriculture in Brazil and will be one of a series of congresses that will assemble at the time of the celebration of the 100th anniversary of Brazilian independence.

Two catalogs containing information of interest to mill men contemplating new building construction or additions, as well as extension of housing facilities, have been issued by David Lupton's Sons Company, of Philadelphia, Pa. One of these is their general catalog No. 11, which illustrates and describes in a full manner the complete line of their service products for industrial use; including Lupton pivoted sash, Pond continuous sash operating device and truss, Lupton counterbalanced sash and counterweighted sash, and projected sash. Complete information and specifications are given in connection with these products, as well as the manufacturers' recommendations for wall and roof construction when their products are to be used. A section describes an entirely new phase of the steel sash industry, the exposition of steel windows for apartments and residences, and other details discussed are industrial sash, doors, partitions and operating devices. The other book is a Casement and Double Hung Window Catalog, showing the application of these products to the home and office, and illustrations are given to show the ornamental effect given in these applications, together with the advantages of this type of window construction.

Both books emphasize the importance of factory equipment of this type that gives the maximum in daylight and ventilation to secure greater production, and the advantages of similar construction in residences, etc. Both are prepared in a complete and attractive manner, and are profusely illustrated with examples of these products in the applications mentioned.

Laziness travels so slow that poverty soon overtakes him.

Notes About Men You Know.

JOHN H. QUINLAN, vice-president and general manager of the Cedartown (Ga.) Cotton & Export Company, spent a part of the month of June sojourning at Hot Springs, Arkansas.

GEORGE F. PAYNE, formerly of the Harmony Mills, Cohoes, N. Y., and other mills, and later with the Dominion Textile Company, Montreal, Canada, has accepted the position of superintendent with the Interlaken Mills, Harris, R. I.

CYRUS WOODMAN, formerly general superintendent of the Bay State Cotton Corporation, Lowell, Mass., has accepted a position as assistant to Mr. Frisbie, president of the Totokett and Attawaugan Companies, Norwich, Conn.

SAMUEL TURNER, JR., has resigned his position as superintendent of the Cabot Manufacturing Company, Brunswick, Maine.

ARTHUR L. BURTON, of the Burton Machine & Specialty Company, Fairhaven, Mass., and an occasional contributor to COTTON'S columns, recently sailed for China, and expects to be gone for some time.

J. L. DUDLEY has become overseer of spinning at the Swift Manufacturing Company, Columbus, Ga.

E. M. ELLINGTON has become superintendent of the Piedmont Mills Company, High Point, N. C., succeeding C. C. Robinson.

R. P. HAMILTON was recently made superintendent of the Great Falls Manufacturing Co., Rockingham, N. C., to succeed M. L. Picklesimer.

G. L. WESTCOTT has been appointed general manager of the Davis-Hale-Ransom Company, Nashville, Tenn.

JOHN R. PENLEY has been appointed superintendent of the Ivy Damask Mill, Salisbury, N. C., to succeed L. A. Mahaley.

J. L. BRANNAN has resigned as general superintendent of the Navarro Manufacturing Co., Corsicana, Texas. He has associated himself with the new Wellman Cotton Mills Company, of Huntsville, Ala., which recently purchased the Fulton Cotton Mills at Athens, Ala., and will convert the equipment in this plant for the purpose of manufacturing hosiery.

FRED M. DUNCAN has become superintendent of the Douglas Hosiery Mills, Douglasville, Ga.

WILLIAM J. GARVEY, 80 St. Nicholas Place, New York, has been appointed as sole selling agent in the New York district by the National Knitting Machine Co., St. Johnsville, N. Y. The Johnson Knitting Machine Co. and the Snyder Knitting Machine Co., prominent in the trade for the past 30 years, are now embraced in the National Knitting Machine Co., with Charles F. Johnson as president, it is announced. The Marvel fast warp knitting machine is built by this company, as is the Marvel sinker top circular machine, which is being used for newly developed knitted fabrics. Mr. Garvey, it is stated, is showing a line of new and original fabrics made on Marvel knitting machines.

J. F. PERKINS has resigned as spinner at the Rex Mills, Gastonia, and accepted the position of night carder and spinner at the Ranlo Manufacturing Co., at the same place.

CHARLES MCLELLAN has been appointed superintendent of the Alden Mills, New Orleans, La.

C. D. RICHIE has been made night spinner at the Hanover Thread Mills, Gastonia, N. C.

J. T. DAVIS has been made overseer of night weaving at the Buffalo Mills, Union, S. C.

CLIFFORD HODGSON has been appointed general manager of the Crawford Cotton Mills, Crawford, Ga. Mr. Hodgson, who is a graduate of the Georgia School of Technology, has for the past three years been located at Athens, Ga., with the Southern Manufacturing Company.

C. P. COLE has become overseer of spinning, spooling and warping at the No. 1 Mill of the Fulton Bag & Cotton Mills, Atlanta, Ga.

M. H. JACKSON has changed from night overseer of spinning at the Ridge Mills, Gastonia, to overseer of spinning at the Ozark Mills, Gastonia.

S. T. PETTY has resigned as overseer of spinning at the Edna Mills, Reidsville, N. C.

THOMAS WEBB, JR., has become associated with the A. E. Staley Manufacturing Co., Decatur, Ill., and will represent this concern in the North Carolina and Virginia territory.

W. P. MOONEYHAM, superintendent of the Lakeside Mills, Burlington, N. C., died on June 5th following an illness of several weeks' duration. He was 58 years of age, having served for 49 years in the textile industry, and is survived by his widow and seven children. He has been superintendent at the Lakeside Mills for four years.

J. E. WICKER was made superintendent of the Lakeside Mills to fill the position made vacant by Mr. Mooneyham's death.

J. M. CREEKMORE has accepted the position of overseer of carding, spinning, twisting and winding at the Crawford (Ga.) Mills.

C. W. COLEMAN, welfare superintendent for the Callaway group of mills, LaGrange, Ga., was elected president of the Southern Textile Social Workers Association at its recent convention in Gastonia.

JOHN C. KOSTER has succeeded F. W. Wagener, Jr., as secretary of the Royal Mills at Charleston, S. C.

T. B. WALLACE has become superintendent of the Sylvan Cotton Mills, Shelbyville, Tenn.

LAWRENCE JOHNSON has become night overseer of spinning at the Ridge Mills, Gastonia, N. C.

M. BOZE, Atlanta, Ga., has become southern representative for the Poland Soap Works of Anniston, Ala. Mr. Boze is a son-in-law of R. T. Grant, southern manager of the United Chemical Products Corporation.

W. R. TATTERSALL has resigned as superintendent of the Limestone and Hamrick Mills, Gaffney, S. C. His future plans have not as yet been announced.

BEN R. DABBS has become southern salesman for the L. B. Fortner Company, manufacturers of aniline colors, Philadelphia, Pa. He will maintain headquarters in Atlanta, Ga.

M. C. SANDERS, of Greenville, S. C., has become the proud possessor of a new son, Manly Calhoun Sanders, Jr., born on June 16th.

TOLHURST

DIRECT MOTOR DRIVEN

EXTRACTORS

Tolhurst 48 inch Direct Motor-Driven "Self-Balancing" Extractor

Controlled by push button operated magnetic switch.

Flexible and self-aligning bearings.

Fitted with adjustable **Tolhurst** Centrifugal Clutch, providing both rapid and smooth accelerating.

Two types:—"Self-Balancing," over driven; "Center-Slung," under driven.

These extractors embody all the superior features which, since 1878, have distinguished **Tolhurst** machines, with the additional advantage of a simple, dependable and efficient direct motor drive.

Particularly advantageous for both the Textile and Laundry Industries.

TOLHURST MACHINE WORKS

Centrifugal Specialists Since 1878

Builders of all sizes and types of Extractors

TROY, NEW YORK

New York Office: 111 Broadway

Southern Rep.
Fred H. White
Realty Building
Charlotte, N. C.

San Francisco Rep.
B. M. Pilhashy
Merchants Ex. Building
San Francisco, Cal.

Western Rep.
John S. Gage
8 So. Dearborn Street
Chicago, Ill.

Canadian Rep.
W. J. Westaway Co.,
Main & McNab Sts., Hamilton, Ont.
400 McGill Bldg., Montreal

The Use of Scheduled Costs

BY J. P. JORDAN.

BEFORE NATIONAL ASSOCIATION OF COST ACCOUNTANTS.

The subject of scheduled costs is one which has been given careful thought and scientific study by many of the most talented accountants in the country. These studies have brought about results in industrial procedures which, without doubt, have proven of much benefit to industry in general. The establishment of the use of Scheduled Costs in industrial plants has assisted to a large extent in opening the eyes of industrial managers to the tremendous importance of establishing standards of costs and using every effort to meet these standards in the actual operations.

Scheduled Costs, as generally understood, consist of costs figured on the basis of what the plant is actually expected to do, it being standardized cost of the direct material with consideration for waste, direct labor, and the proper amount of burden to be applied to the job whether through the medium of machine rates, or through the medium of burden figures on the productive hour or the productive dollar basis. In the figuring of these scheduled costs it is, of course, necessary to assume a standard value of materials used, as well as standard rates of direct wages.

The most common and widely accepted adaptation of scheduled costs is that in the cases of the burdens of the various departments of a manufacturing institution. It being recognized that the only proper method of applying the various departmental burdens to the cost of the product is on the basis of pre-determined or standard rates of burden, applied either by percentage on the direct labor or by rates per hour of direct labor to the various jobs. In addition to the distribution of the burden as mentioned, it is very often necessary to establish a rate per hour for the various machines used by the direct workers, simplified as much as possible to the point where each machine rate would include only such expenses as depended upon the expression of the machine time for proper allocation.

All such burden and machine rates should remain standard or scheduled for as long a time as possible, in order that the estimating of new work and the figuring of actual costs may be expedited and made more accurate by the use of such standard figures. But it is impossible to use the actual burden figures of any one month, or any two or three months, for the figuring of actual costs or of estimates of new work. It is unfair to expect or hope that any one, two or three months will reflect in the records an actual figure which can in any sense be used in the figuring of an accurate cost. It is generally recognized that the overhead of any business is a matter of long average rather than a short average, particularly when up-keep and repairs are taken into consideration, where any one month may be penalized with heavy charges for repairs, while the next few months following may be almost entirely free from such charges. Some institutions, of course, may run fairly steady in all items of repairs, as well as perhaps a majority of the items which make up the various burden accounts. But very few industries can actually boast of having a sufficiently steady flow of overhead expenses month after month to be able to safely use the actual monthly expenditures as the real basis of burden cost to be used in the cost sheets.

In addition to the fluctuation of repair costs, there is also the factor of the rise and fall in volume of business, a factor which must be recognized and provided for by the use of standard rates of burden. The determination, therefore, of pre-determined burden and machine rates establishes one of the elements of scheduled costs. The proving of these costs is through the medium of monthly statements of the actual burdens incurred by each operating department. This proving of the overhead costs may even extend back to many of the original general expenses, illustrated as follows: If a plant generates its own electric power, why should not the power account be so designed as to collect this cost as an actual producing department, with its product measured by meters in order to establish its actual output in kilowatt hours? In this case a standard cost per kilowatt hour may be established as the objective of this department and the monthly statement of cost will immediately show whether or not it is operating to the scheduled cost per kilowatt hour as set up.

Or a company which does a great deal of its own trucking may establish a scheduled or standard cost per hour or per mile of trucking. This may be proved monthly by having a comprehensive expense account for this particular phase of the business.

Again, a company which uses a great deal of steam may accomplish the same results by the use of flow meters and a comprehensive expense account in connection with the generation of steam, proving the monthly results with a statement of how efficiently the department has operated. Even many of the clerical departments may have expense accounts set up, as for instance the payroll department in a large plant where the basic or scheduled rate may be the cost of payroll work per payroll hour of all the men, direct and indirect, whose time is kept and recorded by the pay roll department. This may be broadened to the cost department, to the various stores departments, to the general superintendent's office and so on through various branches of the business where the size and organization of the work will warrant.

With all general expenses closed into the operating burden accounts it then becomes a simple matter to prepare the monthly statement of each department to check the scheduled rate of burden used by the department. Such statements are accumulated month by month, the cost for each current month being shown, as well as the average to date, either from the beginning of the fiscal year, or for the last twelve months elapsed. This average is the figure to watch in order to establish the proof of the accuracy of the scheduled or standard rate as used in figuring the actual cost of work produced. Up to this point there is no question about the use of scheduled costs. In other words, any or all of the indirect expenses of the business must come under a scheme of a standard or pre-determined or scheduled cost, and must be used as a standard rather than as an actual cost month by month.

As in practically all cases direct material costs offer little or no opportunity for profitable manipulation by careful schedules as in the case of direct labor, this factor

(*Continued on page* 729.)

AN OLD TIMER SAYS

I once worked for a superintendent who was as regular as a clock. He was also very "set" in his ways and he bragged about it. We always knew exactly when to look for him, and he always came in the same door and went right down the same alley. Oh, he had some system, that man did!

For example, I always went down "his alley" just before time for him to come through, and picked up all the bobbins or kicked them under the looms if I was a little late and saw him coming; therefore I always had my room in fine shape (?) when he came through it.

If he brought company through the mill he always followed this same route, so my sweepers knew they had better keep that alley clean.

I may have enlarged on the truth a little in trying to bring out my point, but honestly now, Mr. Superintendent, does this illustration fit you in your work in any respect? Of course, you have been an overseer yourself, once upon a time, but it does seem that after some men get to be superintendents they almost entirely forget the training they should have received while overseer, to fit them for the position of superintendent. It is just so confounded easy for a superintendent to get lazy, anyway, that a man must almost have an iron will and a wagon load of determination to avoid it.

Then, too, so many of us excuse ourselves by saying, "Oh, well, I worked several long years as overseer, and I worked very hard for my position, so why not take it a little easier now? I know I deserve it; what have I got a set of overseers for, anyway? If they can't run their jobs I will get another set. I had to run my job when I was overseer."

Well, there's no use for me to ramble on; might just as well come to the point and inform you that if you feel that way about it, Mr. Superintendent, you are guilty, really guilty, the jury is going to meet some of these days and decide that you are just about as big a superintendent as you will ever be, and you will likely retire, probably to an overseer's job, before you are much over one hundred years old.

The textile industry is going forward by leaps and bounds, and if you don't learn to leap and bound with it you will soon be replaced by some live energetic overseer or superintendent from a smaller mill who *can* leap and bound.

When was the last time you walked down a weaver's alley to see how things looked? When was the last time you went over part of the spinning, alley for alley? When was the last time you had the waste from under the cards and pickers left on the floor by each machine so that you could merely walk down the alley and see how they were running?

Oh yes, I know you will say, that's the overseer's job. Sure it is, but do you ever check up on the overseer to try to help him do his work better? You are supposed to know more than the overseer, you are supposed to look at things with a broader vision, you are supposed to be a better overseer than your men. Otherwise, one of them should have your job.

Who will get the benefit if you give them the advantage of your knowledge, anyhow? No man will doubt that the more efficient the overseers, the better the mill will be operated and, incidentally, the better the mill owners will be pleased. Well, then, what are you, as superintendent, doing to make the overseers more efficient?

To put a man in charge of a room and tell him that production and cost is what you want and if he can't get them some other man will—that's the way to be changing overseers all the time, and you should realize that is one of the most costly things a mill can do—to change overseers.

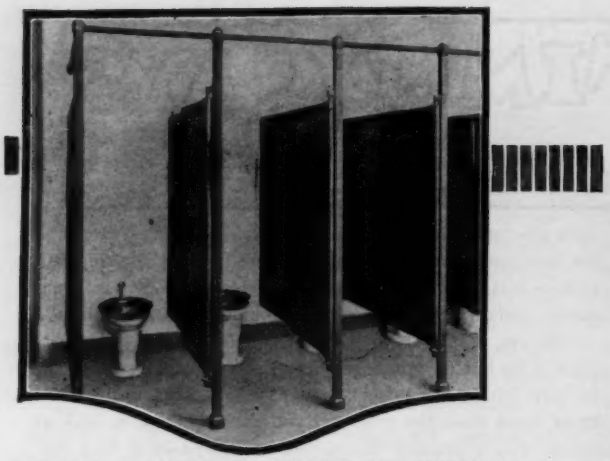
Are your carder and your spinner on good terms? Are your spinner and weaver on good terms? Or are they forever and eternally nagging at each other? Have you just taken it for granted that one or the other is a little hard to get along with, or do you ever suppose that the way the superintendent manages things has anything to do with it? Suppose you give that subject a little thought!

Does the carder believe that the spinner has got it in for him or is trying to work him out of a job when he finds out the spinner has shown you some bad roving; does the spinner think the same thing about the weaver when he knows the weaver has been showing you the laps and crosses on his warper beams? How did you feel about these things when you were overseer? You know the kind of cooperation that brings the best results from the overseer, so why not give the matter some real thought and see if you can't bring about a different feeling among your men.

Here's another thing for you superintendents to put in your pipe and smoke: Whether you came up as a weaver, a carder or a spinner, don't forget that you will have to be very careful that you do not give that department advantage over the others. Let me illustrate with an actual example:

I know of one mill where several years ago the superintendent had been promoted from overseer of weaving. The mill was on dobby work and as many of the styles of goods called for 40s to 44s filling, the spinning production had been reduced so much in making this fine filling that the mill was having on an average of about 150 looms stopped all the time. In fact they had taken the belts off of the looms and were taking it for granted that the looms could not be operated as long as they had to run on those styles of goods.

(*Continued on page* 731.)



For the Seaman Body Corp., Milwaukee, Wis., Klug & Smith, Arch.

See That You Get The Right Metal

THERE'S no mistaking the fact that there are different qualities of metal toilet partitions. You want a partition that fights rust, that stands immovable, that literally will outlast the building it goes into. To get a partition of that quality, see that genuine Sanymetal—the right metal—is specified and installed in your building.

Sanymetal would cost us and you less if we made it out of ordinary sheet steel. But we have found that, for the vitally necessary rust-combating quality, a metal of special analysis must be used. We have found that only the best baked enamel would give Sanymetal a permanent, vitreous finish, hard to chip or scratch. We have found that our special process of electro-zinc plating so lengthened the life of all bolts and hardware that it would be a mistake to dispense with it. We have found that our design of water-shedding base shoe for every post was a real protection at this point. We have found that it was not wise to reduce, for the effect of simplicity in installation, the number of bolts which now insure rigidity.

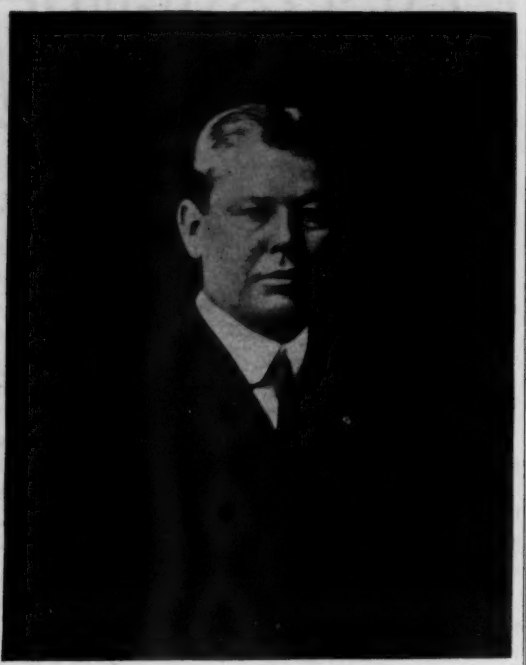
We believe these features—most of which are found only in Sanymetal—are worth the time and trouble and money they cost. And the success of Sanymetal everywhere has proved that people who build for permanence agree with us.

Catalog No. 4 describes Sanymetal Office and Mill Partitions

Catalog No. 2 tells all about Sanymetal.

THE SANYMETAL PRODUCTS COMPANY
986 E. Sixty-Fourth St., Cleveland, O.

Sanymetal
TRADE MARK U. S. REG.



H. M. RUBEY

PRESIDENT, THE RUBEY NATL. BANK, GOLDEN, COL.
FORMER PRESIDENT, COLORADO BANKERS ASSOCIATION
FORMER TREASURER, AMERICAN BANKERS ASSOCIATION

The Certified Balance Sheet submitted by the commercial borrower is greatly strengthened when based upon a complete audit of the year's transactions. Restricted audits or limits imposed upon the public accountant restrict and limit the value of the statement for borrowing purposes.

The members of the Reserve City Bankers Association are on record as endorsing the complete audit as the form of audit to recommend to commercial borrowers.

H. M. Rubey

Published in the interest of better business.

By ERNST & ERNST

How Other Men Manage

Practical Discussions by Cotton's Readers on all varieties of Mill Subjects

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishng plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

Some Points for Comber Men.

EDITOR COTTON:

I take great pleasure in reading the various discussions on carding in your magazine, and find them very beneficial at times. I would also like to say that COTTON is the only textile magazine which takes up the carding proposition to any extent, and this should be appreciated by all cotton mill men. I have failed to read but very few of the articles in COTTON, and to my knowledge, have seen but one or two discussions on combing. To a fine-grade yarn mill or one making fine quality cloth, cotton should be combed, and for that reason a little talk on combing, etc., is worth while.

In the first place, I would like to make this statement —that unless a mill has the proper cotton to work with, it can neither pick, card nor comb it successfully.

The object of a comber is to remove all foreign substances such as dirt and leaf that the card has failed to extract, and to take out a certain percentage of short stock, so as to leave a larger majority of long even fibers to work with, and also to draw out the fibers and lay them parallel with each other.

I will not go into the details of setting a comber, nor with the hundred and one things which are so important, but will bring out a few of the minor details which seem mere trifles, but which still are really quite valuable. In the first place, a good even lap from the ribbon lapper is of the utmost importance. Both the sliver lap and ribbon lap machines must be watched very carefully to see that the top rolls are kept properly oiled.

On the comber, the one big thing is the percentage of waste, which should be as little as possible and still give the strong and clean yarn necessary for the work in hand. The percentage of waste must be kept the same on all combers running the same class of work, otherwise the weight of the sliver will be off. Also, if a comber has more than one head, each head should be so set as to give an even percentage all the way across the knife, and all heads on that comber should be set as nearly the same as possible.

Unfortunately, combers are not made absolutely perfect, and we therefore find variations in certain settings which cannot be helped. Some men claim that a Whitin comber should be set with the angle of the knives all the same which means that some of the corners of the cushion plates are not exactly parallel with the detaching roll. This means an uneven percentage wherever it occurs, and that particular delivery will be lighter on one side of the web than on the other. If the cushion plate is moved away from the detaching roll, more percentage is the result, and of course if moved closer less percentage, therefore, when one corner of the plate is farther away from the detaching roll than the other, there is sure to be a variation in the evenness of the percentage as well as the web produced. For this reason, I claim the cushion plates should all be set parallel to the detaching roll which would cause the angle to come off a little, but at the same time the needles of the half lap would comb exactly the same amount of cotton on each end of the cushion plate, and would therefore give an even web at that delivery. With all the webs uniformly even on a comber, the percentage of waste will likewise be uniform.

As a suggestion to help make more even yarn—a spare can of comber sliver made up of sliver obtained from the comber table before passing through the draw box, if pieced at the draw box when an end breaks in the sliver pan, will save a lot of light comber sliver, which of course will help the work further along.

In regard to production on a comber or any other machine in the mill, all belts should be kept clean and tight A little experimenting in this line will prove its value. A piece of leather which rubs continually on the inside of a belt will keep it clean at all times. The leather can be fastened on to a machine by brackets bent in various ways and held by a bolt, which is most always in a convenient place. (See page 38, November, 1921, number of COTTON.)

I would also like to suggest to anyone using aspirators or condensers on their combers to count one hundred nips when taking percentage, rather than thirty or forty as on an old style comber. Aspirators and condensers are apt to make a bunchy percentage, particularly when a comber starts up, therefore these bunches will be more evenly distributed in a large number of nips and a more even percentage will be the result. G. S. P. (Mass.)

An Opinon on Tandem Creightons.

EDITOR COTTON:

I read with much interest the article on "The Tandem Use of Creighton Openers" in the April issue of COTTON. I think COTTON has started something in its technical columns that it should be proud of. I have never had any experience in a mill where these openers were used, but I have heard of their merits when operated as a single unit. I note in the article that when they are used in tandem that in addition to cleaning and conditioning, a mill is able

Bales Pounds Bolts Yards

All the way through, "We have found the Monroe Calculating Machine very serviceable and satisfactory," say **Fulton Bag and Cotton Mills.**

FROM the time the cotton is picked until as cloth it leaves the shipping room, every step of the way means Figures and Figuring.

At cotton docks, in cloth rooms, weave rooms, stock rooms, and back in the office, Monroe Calculating Machines are constantly being used to make quicker, easier and safer, the work of figuring.

Textile totals must be true; loom layouts correct; shrinkage must be exact; weight calculations accurate.

You will find the new K Model Monroe Calculating Machine to be the quickest, most accurate, as well as the simplest answer to every figuring problem. The Fulton Bag & Cotton Mills go on to say: "We use the Monroe in checking our daily shipments, extending and figuring the prices per thousand; on our payroll; invoices for goods bought and for practically all **figuring** purposes."

Ten minutes' instruction of the Monroe's simple operating principles is all the time it will take for anyone in your office to apply the machine to your work.

Swift, accurate and simple—you will find the Monroe fits into the figuring problems of the textile industry in a way that means worth-while savings in time and money.

You should see the new K Model Monroe applied to your own work to fully understand its usefulness to you. The coupon simply invites a FREE TRIAL of the Monroe at no cost or obligation to you.

MONROE

REG. U. S. PAT. OFF.

Calculating Machine

MONROE CALCULATING MACHINE COMPANY

General Offices: Woolworth Building, New York City

Offices rendering Monroe service at all principal points in the U. S. and Canada.

The new K Model Monroe is made in a size to fit your figuring needs —20-Place, 16-Place and 12-Place capacities.

COUPON

MONROE CALCULATING MACHINE COMPANY
Woolworth Building, New York City.

It it understood that this COUPON bearing the signature of my firm entitles us to a FREE TRIAL of the Monroe without any cost or obligation to us to purchase.

Firm Name .....

Individual's Name ..... Title.....

Address .....

.....

C 7-22

to cut out one process of picking, which cuts down the overhead in the picker room both in labor cost and also in power. I think American cotton manufacturers of this age should consider the question of having these openers installed as quickly as they possibly can, as the preparation of the cotton is a big item in cotton manufacturing today.

C. A. R. (N. C.)

Losses Through Waste in the Mill.

EDITOR COTTON:

The period of depression, from which we are now emerging, has produced varied results among the textile mills of the country, many of which have been very far-reaching in their effects, and I believe that the "hard times" have been a large factor in the development of a greater efficiency. It has directed the attention of mill managers more than ever before to leaks and wastes in manufacturing. A person who says there exist no wastes and leaks in the cotton mills of the present day, knows little of the real conditions inside the mill, for in reality little attention has been given to anything in the average mill other than the machinery, the buying and selling of goods, and other items which show immediate influences. The problem that many up-to-date mills are now considering is that of analyzing their entire organizations with the hope of being able to detect most of the weak places.

To begin with, few mills really know what kind of cotton they can use to the best advantage for their particular class of goods. The government has for years run tests which have clearly shown that many mills are using a much better grade of cotton than is necessary. Of course now, with the margin between grades and off colors very small, the saving would not be as great as in the past few years, but even now considerable money could be saved by wise buying of cotton. I feel that, although the cotton buyers of the country are well up on the merits and demerits of cotton, very few know as much about cotton from the manufacturing point of view as they should know. They practically all realize the importance of the tensile strength of the fiber and the necessary length of staple, but there they end in knowledge and experience, and there is really where some mills have lost thousands of dollars, for some mills have been paying a premium for white cotton to be used in bleached and dyed goods, whereas it has been absolutely proven that light stains and tinges can be bleached out perfectly white and dyed satisfactorily in most colors. Blue tinges and stains being exceptions in some cases. Of course in buying off-color cotton the purchaser must be careful of weak fibered cotton; on the other hand some of the strongest cotton that I have seen has been yellow stained, and after several experiments the spinning qualities proved to be much better than that of many different lots of strict middling white cotton of the same staple. Some manufacturers have also been badly fooled in regard to the actual staple that they needed and some have learned this profitable lesson through the inability to buy their usual staple during the past year.

It is hardly necessary for me to go into details in regard to the purchasing of supplies, for most mills recognize the need of a suitable buying system. That is the reason that purchasing agents have sprung up over the country. But after the buying, what follows? There is where many mills make waste. In the first place, no purchasing agent or manager can buy scientifically unless he is rightfully informed of needed supplies. If you were to go into the supply room of the average mill, you would find a man in charge who has little knowledge of his supplies, very little system about receiving and letting out the various items, and practically no check on amounts used and needed. Of course I realize that conditions are not so bad in many mills, and some mills have an ideal system, but the average mill under the present methods, has little real knowledge of its supplies.

In order to determine manufacturing costs, it is absolutely essential that a correct knowledge of supplies used by each department be available, and of course this necessitates a departmental supply room and a good man to run it. It is the usual custom to use some spare room about the center of the mill for supplies, regardless of its suitability. This is a mistake, for the supply room is similar to a mercantile establishment. It is there goods should be inspected and checked. It is there each department procures its supplies, and it is there that a charge should be made for them. Through a well arranged supply room, a manager can keep a close check on the relative merits of the different items that are bought. He is also able to catch any waste of supplies in the mill. This itself amounts to a great saving if correctly followed up to say nothing of the aid he will receive therefrom in buying.

There are hundreds of small leakages in each department. It is true that they are small, but in a year's time they amount to a good deal. Many operatives hardly think they are doing anything wrong if they carelessly throw the end of a lap on the floor, which is more than likely swept up with card room sweeps. Such a person thinks still less of allowing card strips to drop, but if he would only stop to figure the difference in the value of a pound of card sweeps and a pound of cotton or strips, he would possibly be more careful. I do not claim that all this wastage can be stopped, but I feel that a great portion of it can be, by closer supervision on the part of the overseers and section hands. The handling of waste is rightfully in the hands of darkies or an unintelligent class of help, but by all means this should be watched over very carefully for many dollars are lost in this way.

Belt slippage, proper lubrication of machinery and machinery inspection demand paramount attention in a mill interested in eliminating the weak places. Belt slippage alone has been known to cut the production of departments five per cent more than the best authorities allow for it. A good many of the larger mills are now employing young textile graduates solely to watch such things as belt slippage, lubrication, etc. There are so many points of a similar nature that should be watched closely that I will not attempt to go into them, for each mill is really up against a different proposition when it comes to the individual departments.

The success of a department is largely in the hands of the foreman. A successful foreman must by all means be a practical man, and he should, on the other hand, by all means be an educated man. The day has passed when an uneducated man can even hope to successfully run a room, because competition is demanding scientific management throughout the industry and it certainly stands to reason that the uneducated man is handicapped in every

Photograph of Anchor Post Chain Link Mesh installation of 1860 feet at the plant of the Manhattan Rubber Company in Whippany N. J. Erected in 1920

Protection During Construction *---and After*

If the completed buildings are worthy of protection, the raw steel, stone, lumber, and man-power which go into them are just as deserving. Before excavation is completed, with the masonry scarcely begun, Anchor Post Fences and gates can be in place. Meddlesome trespassers are kept out; accumulating construction materials are insured against theft by night or day; and the movements of expensive labor are regulated.

Ultimately far more economical than the makeshift barrier, which is broken up along with concrete forms and scaffolding, permanent Anchor Post Fences and Gates erected at the very outset, afford the plant protection during construction—and after.

Anchor Post Fences and Gates "stand the gaff" when pioneering around construction work.

GALVANIZED AND ANCHORED

—they sturdily survive shocks and strains, and register no bruises or rust-spots. They are on the job as early—and almost as long—as the masonry itself.

Plan for Anchor Post when you plan for that new building!

ANCHOR POST IRON WORKS
HUDSON TERMINAL BLDG., 52 CHURCH ST., N. Y. C.
FACTORIES: GARWOOD, N. J., and CLEVELAND, OHIO

2416-G

BRANCH OFFICES

BOSTON, MASS.	79 Milk Street
CHICAGO, ILLINOIS	8 So. Dearborn Street
CINCINNATI, OHIO	141 East Fourth Street
CLEVELAND, OHIO	Guardian Building
DETROIT, MICH.	4th Floor, Penobscot Bldg.
HARTFORD, CONN.	902 Main Street
MINEOLA, L. I., N. Y.	167 Jericho Turnpike
PHILADELPHIA, PA.	Real Estate Trust Bldg.
PITTSBURGH, PA.	Room 404 541 Wood Street
ROCHESTER, N. Y.	1604 Main Street, East

SALES AGENTS

ATLANTA, GA.	Bendilieu & Applewhite 1317 3rd Natl. Bk. Bldg.
BIRMINGHAM, ALA.	2011 Third Avenue C. S. Caldwell
DALLAS, TEXAS	Southern Wire & Iron Co.
GREENVILLE, S. C.	Henry H. Orr 315 Palmetto Building
KANSAS CITY, MO.	The Pierce Co. 930 Wyandotte Street
KNOXVILLE, TENN.	Chas. M. Allen Co. 407 Burwell Building
LOS ANGELES, CAL.	J. E. Dwan 341 Citizen's Nat. Bk. Bldg.
MINNEAPOLIS, MINN.	Speers-Jevne Co. Builders Exchange Bldg.
NEW ORLEANS, LA.	J. T. Mann Co., Inc. 308 Tchoupitoulas St.
PORTLAND, OREGON	The Merrill Co. Chamber of Commerce Building
RICHMOND, VA.	R. M. Nolting 119 Mutual Building
SAVANNAH, GA.	Chas. M. MacLean Co. Merchants Natl. Bk. Bldg.
SEATTLE, WASH.	F. T. Crowe & Co. 508 Westlake Ave., North
SAN FRANCISCO, CAL.	Richard Spencer 922 Hearst Building
ST. LOUIS, MO.	Reinforced Concrete Co. Arcade Building

FIRM—BECAUSE THEY ARE ANCHORED

Anchor Post Fences

PERMANENT—BECAUSE THEY ARE GALVANIZED

way. The procuring of a good foreman should be the first step in a war against waste and inefficiency, and the few extra dollars that a mill may have to pay to get competent overseers will not be wasted.

That leads up to the rank and file of employees. I wonder if there is a mill in this country that can really say that they haven't a "dead head" on their pay roll. I do not refer to spare hands for they are needed, but I refer to numbers of employees who are carried on payrolls who are not needed, or who could be doing other work satisfactorily along with work assigned to them. Foremen and superintendents can save the mill quite a bit of trouble and expense by being more cautious in hiring help. A fairly good knowledge of an applicant's qualifications and character should be had before hiring him unless circumstances require immediate action. By doing this, undesirable help can be detected and the employees can be placed according to their qualifications.

A great number of cotton mills are still using their antiquated methods of operating and although they realize that they ought to change for the more modern and better systems they seem to fear the results. It is true that a mill should be cautious in making a change, but they should also realize that they must modernize their organization or lose out. In removing the weak links, a complete analysis of every part and system in the organization should be made, first, reasoning out every step, and then taking action. In the end the leakages and waste will start on the decline. M. W. H. (N. C.)

Prefers Grid Bars to Screens.

EDITOR COTTON:

The degree of perfection attained in the manufacture of cotton yarn and cloth depends on the carefulness and skill exercised in the preliminary processes. The purpose of the picking machine is well known: it is to get out all the dirt and leaf from the cotton, and to take the loose cotton as it comes from the bale and form it into a lap, in which form it must be presented to the cards. This initial process is an important one, and in order to increase the efficiency and excellence of the work done, a number of improvements have been introdued on these machines in the past few years which have been found of great advantage in the picker room. However, to my mind, the triple tandem arrangement of vertical openers with apron delivery are the greatest cleaning agents of the hour. They are nothing less than Creighton openers with a new name.

It will be remembered that the Creighton opener was ostracized about the same time the flyer-lead system was ostracized. At that time the cry was that the Creighton opener chewed and injured the stock and that the flyer-lead strained the roving. We know better now, and we find many mills equipped with Creighton openers. The flyer-lead system will follow—mark my words.

However, I think the cleaning efficiency of vertical openers could be increased to a large degree by increasing the cleaning area by making the machine higher, and by having grid bars instead of screens.

In the past few years there have been great changes in the construction of cotton machinery resulting from greater speed and production demands. A tour of inspection through any cotton mill equipped with the most modern appliances will quickly convince the most skeptical.

The time is not far off when the double coiler system will be universally adopted in all cotton mills. The doublings on the drawing frames will be doubled from six to twelve. Please remember that once we had but three doublings on all drawing frames and later increased to six. Why not twelve? History would only repeat itself.

No mill man can deny that the above coiler system and doublings will increase the perfection in the manufacture of yarn and cloth. It would give us the lightest sliver possible from the card without loss of production, and at the same time have all slivers arranged at the drawing frame so that every working surface of each drawing roll would be occupied. Wash (Mass.)

Variations in Twist.

EDITOR COTTON:

The excessive variation of twist in yarns is a serious matter. As there is no such thing as perfectly even yarn, there cannot be perfectly even twisted yarns. The natural unevenness of all yarns causes a relative amount of unevenness in the twisting. The evener the yarn, the better the twisting will be. But the best of yarns have a few thick and lean spots, and it is impossible to prevent the twist from running more into the lean spots than into the fat spots. This is because the lean spots give more easily, and lend themselves readily for the reception of more turns per inch than the thick spots do. This cannot be entirely avoided in any yarn. The only partial remedy is to make the yarns as even as possible, and the twist will naturally correspond to the quality of the yarn.

What we are after now, is the prevention of unnatural or excessive variation of twists in yarns, the causes of which are many. Hard twisted ends and soft twisted ends mixed into the work are the cause of much streaky and other bad work. Abnormally twisted yarn, whether over- or under-twisted, is always weaker than normally twisted yarn. Hard twisted ends, in addition to making streaks on the face of fabrics, will be apt to kink, or be so wiry that they will not beat up and lay so well in the cloth.

In colored work there is a big difference between the color, shade or tint of a hard end and a soft end. Although apparently dyed the same color they will not give the same effect on the face of the cloth. Hence the importance of having as little variation in the twist of all yarns as possible.

There are many common faults which cause much variation in the twisting of yarns, such as anything which interferes with the proper speed of the spindle. Bands slip very easily. Anything which causes the spindle to revolve sluggishly will cause the band to slip. Among the things which will cause this condition are: oils too heavy for the spindles; wornout bolsters and spindles; crooked spindles; waste between spindles and bolsters; dirt in the bolster; travelers too heavy; wornout rings; broken and unbalanced bobbins; improperly adjusted spindles and rings and thread guides; overspeeded spindles; mixed sizes of spindle banding or waste-ladened banding; overworn spindle whirls; spindles insufficiently oiled; spindle oil too light; lean yarn or single work; thick ends or double work; thick and thin places in the yarn; wrong twist gears; top rolls slipping; slack bands; traverse too long; and the

Announcing

REDUCTION IN PRICES

on

Oxweld and Eveready Apparatus for Welding and Cutting Metals

EFFECTIVE JUNE FIRST, prices on Oxweld and Eveready Apparatus were substantially reduced.

Every manufacturer or shop owner, user or prospective user of the oxy-acetylene process for welding and cutting metals will find it to his advantage to inquire for information concerning this price reduction.

We especially stress the fact that this reduction has been accomplished without change in the superior design of Oxweld and Eveready Apparatus or the completeness of Oxweld Service.

Full information and any other service may be secured from our resident Sales and Service Engineers in the following cities:

NEW YORK	CHICAGO	PITTSBURGH	OMAHA
BOSTON	ST. LOUIS	DETROIT	PORTLAND
PHILADELPHIA	MILWAUKEE	CLEVELAND	SEATTLE
BALTIMORE	MINNEAPOLIS	NEW ORLEANS	SALT LAKE CITY
NEWARK	CINCINNATI	HOUSTON	LOS ANGELES
BUFFALO	INDIANAPOLIS	SAN FRANCISCO	DENVER
BINGHAMPTON	BIRMINGHAM	TULSA	

Consult Your Telephone Book

OXWELD ACETYLENE COMPANY

Carbide and Carbon Building
30 East 42nd Street, New York

WORLD'S LARGEST MAKERS OF OXY-ACETYLENE WELDING AND CUTTING APPARATUS

difference between the large and small bobbin and the full and empty bobbin.

These things, when not right, will cause more or less variation in the twisting of the yarn. To have even twist in the yarn, it is absolutely essential that each and all of these matters are carefully inspected and as perfectly adjusted as possible.

While well carded cotton and even roving is the foundation of good yarn making, without even twisting, the yarn sliver is useless. Without twisting we cannot have yarns. The yarn foundation is held together by the twist, the same as the foundation of a house is best held together by the firm cementing.

Of the list of very common defects mentioned as interfering with uniform twisting, I wish to emphasize a few of these defects which are not commonly noticed nor remedied in many mills, and then how seriously the matter of twisting is affected by them.

First, we will take up the matter of waste-bound spindle banding. Where machinery is not kept clean, and where the spindles are over-oiled, the spindle banding soon becomes waste-laden. Machinery that is not well cleaned will permit waste and lint to gather on the bands, and when the spindles are over-oiled, the oil will splash and spray on the running bands. This gums and makes them sticky, so that they then pick up waste and lint very fast, causing them to increase in size.

Where the bands are bound with waste, they should be carded gently until all of the waste is removed. It will be necessary to do this gently, because undue pressure against the bands will stretch them until they are useless. A waste-bound band puts in less twist than a band of normal size. It drives the spindle at a lower speed, and thus it twists correspondingly less. The reason for this is very plain, and yet it is not generally well understood among spinners.

Spindle bands revolve upon their centers and therefore drive the spindles upon this basis. If a spindle whirl is 15/16 of an inch in diameter and the bands are ⅛ of an inch in diameter, as the bands revolve upon their center line, one-half of the diameter of the band must be added to the diameter of the spindle whirl, this increases the size of the spindle whirl to one inch in diameter. Now, if the band becomes waste-bound so that its size is increased to ¼ of an inch diameter, the spindle whirl together with the new size band has a new driving diameter of 1 1/16 inches. This reduces the speed of the spindle over six per cent. If the yarn requires 30 turns of twist per inch, when the bands are clean and of normal size, how about the twist when they are increased ¼ of an inch in diameter by the waste clinging to them? There will be only 28 turns of twist being put into the yarn.

This situation is not over-drawn. It is the actual condition of things as they exist in some mills; particularly in some of the coarse and medium yarn mills.

In some very fine goods mills, the writer has observed another state of things which is generally passed unnoticed. Spindle whirls wear out smaller in size continually. After a set of spindles has been in use from 15 to 20 years, the whirls are no longer of the normal size. In one mill on fine combed goods, the spindle whirls, when new, were ¾ of an inch in diameter. After 20 years of service, many of them were worn down to ⅝ of an inch in diameter. They do not wear out alike. They are mixed in, in all degrees of wear. This makes the matter even worse. What is the difference between the twist put into yarn by a whirl of ¾ of an inch diameter, and one of ⅝ of an inch diameter? This will make a difference of over 12 per cent in the amount of twist. If the yarn is wanted with 40 turns of twist per inch, the smaller or overworn whirls will put in 45 turns. This will make a big difference and weaken the yarn accordingly.

The proper way out of this mix-up is to caliper the whirls and place them according to their respective sizes, on frames by themselves. Each frame must be plainly placarded with a new constant number. A different twist gear will have to be put on for each different size of spindle whirl, to make up the difference and to compensate for the twist.

Of late years, a great deal of attention is being given toward eliminating as much of the more common twist variations as possible. To this end a great many mills have altered their warp spinning from warp wind to filling wind. In this manner, they have overcome the variation of twisting between the full and the empty bobbin. This is owing to the fact that the twisting distributes itself more evenly with a filling wind system, than with the warp wind arrangement.

So important has this become, in fact, that a firm of machine builders has invented a new spinning frame to overcome the variation of twist which is incident to the difference between the twist that is being put into the yarns when the ring rail is en route toward the bottom of a long traverse, and when it is en route toward the top. On this new spinning frame, the ring rail is to remain stationary. It is the spindle rail which will move up and down. The distance between the bite of the rolls and the ring traveler will always be the same. This will also insure positively even tension, which, in turn, insures evener twisting. Finer yarns can also be spun.

To overcome much of the natural unevenness of yarns as made in former years, and in order to overcome uneven twisting, more attention is now begin given to cotton blending and mixing. Beaters on pickers are being slowed down from 1200 and 1400 to 1000 r.p.m. Card slivers are being reduced from 48 and 60 grains down to 36 and 42 grains per yard. Drafts are being shortened, more doublings are being resorted to, and the speeds of spindles are being reduced.

The fact is it is impossible to have even twisted yarns and rush the stock through, half cleaned, too large in sizes and at too rapid a speed. To make good work it is necessary to slow down and take more precautions against all possible matters which make havoc with the even twisting of yarns. H. D. Martin (R. I).

Systematising Repair Parts.

EDITOR COTTON:

Any machine repair shop in a textile mill has more than one difficulty to overcome. Whether the pieces to be replaced are of wood, or of metal, there is always the uncertain element of how many to keep finished, how many to have all ready to make adaptable to the machine that needs them to be applied.

We had been keeping for some months the time that any machine was stopped for repairs, and the reason that the part was not ready when needed, and we found

EDWARD A. STUHRMAN

Mem. Am. Soc. C. E.
Mem. Am. Concrete Institute.

Candler Annex, Atlanta, Ga.

General Structural Engineering
In
Steel and Reinforced Concrete

Industrial Plant Layouts.

Warehouse—Factories—Commercial Buildings.

Accurate Preliminary Estimates of Cost.

Appraisals. Reports.

some very curious results. Some of the easiest made wooden pieces, that required little stock and less labor, were the ones that were not on hand, finished in the shop, when the card, or frame, or loom, stopped for repairs. Again, things that required a large amount of lathe work, planing and fitting, were on hand in quantity. and took up space that was designed for small castings, and other parts.

The matter was taken up with the machine builders, and all the information possible obtained, as to cost of the parts they made and shipped for repairs. With these lists in hand, we went over our foundry patterns, and checked those that were not found on the builders lists. Then we went over the bills for repairs that we had, and noted when the parts needed were more in number, or more difficult to fit than we found time to equip in the repair shop of the plant.

We then made a tentative list of all the articles that made up the repairs of the weave room, and made a rough estimate of the requirements for six months. Part of these we ordered direct from the builders, and then estimating the amount on hand, gave the orders to the machine shop to order the balance from the local foundry, from which the castings were furnished. Hiring extra men in the shop, we devoted their time to making the requisite number of pieces for stock that was needed.

This surplus stock we put in a closed room with a supply man in charge. The loom fixers were instructed to bring back the worn or broken piece to the storeroom, and no piece was taken out, unless the one that it was to replace was presented in exchange. It took some months to get even that room properly stocked with the repair parts needed.

After this was done, the other departments were taken in turn, and by the close of a year we had all the repairs well in hand that the various rooms called for day by day. Then this stock was not allowed to decrease. The number of pieces necessary to insure continuous operation of all the machines, and the odd parts connected with the transmission end, were kept up to the maximum.

It required a considerable outlay at first, but it immediately decreased the repair payroll of the plant so we could allow a number of hands to go, and, as the master mechanic gained a better knowledge of the pieces that needed to be kept in stock, the work in the shop could be laid out to better advantage.

The bills for repairs grew continually smaller, and the list of stopped machinery practically was wiped out, at least for repair parts. We found that many times the castings ordered had been based on guess work. If the order called for certain small pieces in quantity, the foundry people seemed to think that it was only fair that enough larger castings should be included to make the moulder's work easier. We found that when this call for an extra amount of small pieces was needed, that we secured better results by a graduated price with the foundry.

When they found what was the value to them of the work on the smaller type, they made a price commensurate with the extra labor, and we had fewer pieces to reject, and the wear of the part was less.

How far any plant is justified in keeping the large stock of repairs that adopting this plan in full would require, each of the managers must decide for himself. This, at least, we must all admit, a most important department of any plant is the one devoted to making the requisite repairs, and the keeping of the stock up to every day calls. Where the line should be drawn depends on the size of the plant, the style of work produced, and the number of different makes of machinery that are installed.

It is a most vital question, as delay of any kind in a textile plant is the sure road to low production and high cost. When every nerve is strained to bring back to its normal average the output of all the rooms, when all possible economies are necessary to gain that result, we should take up carefully this most important question of saving stoppage, and any way that it can be decreased and eliminated in part or entirely should be adopted.

A. H. G. (Conn.)

Classifying Defects in Cotton Cloth.

EDITOR COTTON:

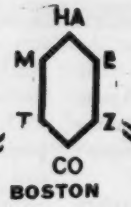
During the many years I have been overseer of the cloth room, I have visited extensively among the mills and I have been particularly impressed with the fact that hardly any two mills, or any two men, designate cloth defects by the same name. It is quite true that names are only valuable insofar as they designate or make known certain things, such as a horse or a mule, but it would hardly be sufficient, especially if we wanted to be explicit, to say "a horse," for it might be a gray horse, a spotted horse or a black horse. Neither would it be proper to say an "animal," for in that case it might be either a horse, a mule or a man. Yet many mills do this very thing; for instance they call a place where the warp and filling are not properly interlaced, "a bad place." This practice seems popular among boss weavers and superintendents who have formerly been boss weavers.

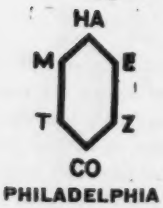
On its very face this is ridiculous. It is just like calling a horse an animal, for anyone who stops to think knows that any defect, strictly speaking, is "a bad place." In this same connection, many mills call small thin places "shuttle marks." A shuttle mark, properly speaking, can only be used in connection with drill. Not only is this practice of generalizing common, but there seems also to be an utter lack of a common term for even the most simple of defects; for instance, I have heard "thin places" called "breaks," "stripes," and "misses," any of which I contend is improper, and likely in some cases to lead to misunderstanding and confusion.

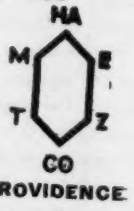
Another defect that I find hard to get properly termed is the "bad place" referred to. I contend it should properly be called a "float," because the filling floats over the warp. Only a few mill men agree with me; they want to call it a "bad place," "hole," "overshot," etc.

Then take a "dropped thread," as I term it. Some men want to call it a "loose thread," and some others insist on calling this a "hanging thread." I refer to where a harness eye, for some cause, has beeen allowed to run too low or too high, and the particular thread or threads it controls do not properly weave into the goods, possibly miss only a few inches before catching, and then perhaps run several feet or yards, catch for a few picks, and then run loose again. I contend that this is neither a loose, nor yet a hanging thread, and that both these terms apply to other defects that cannot well be classified by other terms.

Another practice I would criticise is that of generalizing or grouping all oil defects. In so many mills that I have seen they call it all "animal" and let it go. I believe there







Protect the Dye Industry!

BUT don't hamstring industries using dyestuffs. Ad valorem and specific rates will afford adequate protection without any embargoes or licenses.

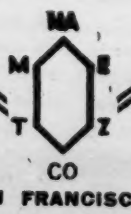
Aside from the line of Dyestuffs, Intermediates, Cotton Finishes, Turkey Red Oils, Soluble Oils and Leather Oils made in the United States by

CONSOLIDATED COLOR & CHEMICAL CO.
CENTRAL DYESTUFF & CHEMICAL CO.
WILLIAMSBURG CHEMICAL CO.

and other American manufacturers, we will obtain on licenses all importable goods manufactured by

BERLINACTIEN GESELLSCHAFT FUR ANILIN-FABRIKATION
FARBWERKE VORM, MEISTER, LUCIUS & BRUNING
FARBENFABRIKEN VORM, FRIED, BAYER & CO.
CHEMISCHE FABRIK GRIESHEIM ELECTRON
FARBENFABRIKEN MUEHLHEIM
LEOPOLD CASSELLA & CO.
KALLE & CO.

H.A.METZ & CO. Inc.
One-Twenty-Two Hudson Street, New York City.
Boston Philadelphia Providence Chicago Charlotte San Francisco



should be two terms used, "black oil" and "yellow oil," as with the color known its source, in many instances, can be much more easily determined, even an "oil spatter," may come from either the shafting, or the loom cam; if from the cam, it will almost invariably be black; if from the shaft, yellow.

I would also differentiate between oily and dirty filling for the same reasons. Oily filling usually comes from the spinning or card room, while dirty filling has been thrown on the floor somewhere, usually in the weave room, and to classify all such filling as oily very often puts the blame on an innocent person and also retards the finding of the cause. These two classes of defects are easily distinguished. One is a solid stripe, either black or yellow. The other is a more or less broken one, owing to the stain being only on one side or at least on a part of the quill or bobbin.

Thinking of this difference calls to mind an amusing experience that I had several years ago. This experience also has a direct bearing on this subject, so I am going to relate it. I had gone to be overseer for a large and progressive mill where they had a very elaborate form of imperfection report. I have never seen one more complete, but on this report one of the spaces, in which we were supposed to report defects, had as a printed head "Music." This stumped me. I had never heard the word music used in connection with cloth defects before, nor have I seen it since. I made some inquiries but since this form of report was somewhat new none that I questioned seemed to know. As I was a new man and didn't want to show my ignorance, I took a chance and waited for enlightenment. It was not long in coming. One morning after I had been there about two weeks, the superintendent came rushing up to my desk and speaking in a very earnest, if not in an angry way, said, "Say, don't you have any music in the cloth?" The way he said it, if nothing else, appealed to my sense of humor and I began laughing. If he had seemed sore before, he now became actually angry with me. When I could control myself, and he had vented his spleen sufficiently, I asked him, "When was music an imperfection in cloth; was it a miscord (some of our goods was corded madras) or was it a loom out of time?" He began then to see what I meant, and also laughed. I found they were calling dirty filling "music" because its appearance in the goods looked somewhat similar to a printed line of musical notes. But I contend even that was far better than the more common practice of calling everything "animal."

I believe I speak advisedly when I say that all well managed mills have some form of imperfection report. If they have not I am quite sure they should have, for only a few of those about a mill whose duty it should be to help prevent bad work ever see the "seconds" or bad cloth. And even these, if they knew about it sooner, would often find and correct the fault in time to save much further loss. Then the imperfection report is about the only means that the superintendent has of knowing that things are wrong, until, in many cases, much damage has been done. But if we are to have such a report, does it not stand to reason that it should be comprehensive, phrased in plain language and sufficiently full to cover the needs of that particular mill? Nothing should be left to be guessed at, and the blame should, so far as possible, be placed where it belongs. If there was a standard term in use to designate each of the most common defects, this would be easy, but as it is now, I contend that much of the practice is worthless and many of the terms meaningless.

Another good that would be dervied from a standard term to designate defects would be that articles in the textile journals would be more effective as all readers would speak in the same technical language. Even with my years of experience and training, I very often find it hard to comprehend what some writer means when referring to some cloth defect. For instance, we often see such terms as "sleezy," "roey," "brackish," "reedy," etc. Now do not these terms apply more or less to the same condition, and would it not be far better if we could settle on some one term and use it. Really I believe that the use of generalities is more common in the press than in the mill. This is very confusing to our younger brothers who are coming on behind us, and who look to the printed page for much of their information. I have had more than one to come to me with such problems, in fact this letter was suggested to my mind sometime ago by just such an occurrence.

I would like very much to hear from someone else on this subject, for I feel that its discussion will lead to some good. I consider it, like "cloth tolerance," a problem very difficult to solve, yet by an open and impartial discussion I am quite certain that we can get many of the ambiguous terms discarded and others much more descriptive substituted.

T. T. C. (N. C.)

Bobbin-Lead Versus Flyer-Lead.

EDITOR COTTON:

It is interesting to note "How Other Men Manage" as related in the discussion pages of your valuable paper. Especially have I been interested in the many things "Wash (Mass.)" has said from time to time. He seems to think that the common speeder or fly frame is very complicated and imperfect in its present state; therefore he makes a request for an inventor to more fully develop the fly frame into a more practical working state.

In his letter published in the July, 1921, number, "Wash" asked the questions: But is it not a fact that a high speed will make a more compact bobbin, which means a slack tension; and is it not also a fact that the firmer grip at the termination of the presser pad, due to high speed, will retain the twist in the strand? Then he says if the reader is interested in fly frames he wishes he would keep the foregoing facts in mind. He then makes another statement which he made years ago, and one that remains unchallenged, that the fly frame is the most imperfect machine in a cotton mill. He then attempts to connect Newton's laws of motion with his troubles. He also gives the details of a test run on two different fly frames for a considerable period of time. Moreover, he seemed to fail in making any connection with his test more than on the fine frame he ran with one tooth less twist on one than the other, and there appeared to be as much twist in the roving coming from the Dunn frame as in that coming from the Bodden frame. (I suppose this was a flyer test.)

But he comes to the real heart of what he considers few men understand by saying that he presented the foregoing test to show that a man will get more out of a fly frame when he understands the relationship between the cones and flyers. He further states that he was only able to run less

THE NEWPORT COLORS

For Cotton and Silk Knit Goods

Announcing the production of
NEWPORT DEVELOPED BLACK S
EXTRA CONCENTRATED
This superior developed black is now ready for the market
Intense Fast Economical

NEWPORT
TRADE MARK
"COAL TO DYESTUFF"

NEWPORT CHEMICAL WORKS, Inc.
PASSAIC, NEW JERSEY

Brance Sales Offices:
BOSTON, MASS. PHILADELPHIA, PA.
PROVIDENCE, R. I GREENSBORO, N. C. CHICAGO, ILL.

Why Don't You Get Into the Profitable Tire Fabric Field?

One of the most profitable propositions in the textile industry today is TIRE FABRIC, and we offer a distinctive service to mills desiring to enlarge their scope or change over their mill.

Located in the heart of the rubber industry and in close contact with tire manufacturers, we are able to render you valuable assistance—an engineering and market service combined.

We design, supervise construction, and completely equip mills for any tire fabric process. Our organization consists of men with more than a mastery of architecture and construction engineering. They are practical mill men who have been specializing for many years in the operation and management of tire fabric mills.

Through our sales department we create markets for yarn and cloths of various construction that hitherto might not have been considered by textile manufacturers. Our special market and sales reports should be of interest to you.

Through an arrangement with a financial organization, we are enabled to finance mill projects when it is desired.

Write us that you are interested, and we will gladly send you some interesting data. We can serve you in many ways.

TEXTILE SERVICE & EQUIPMENT CO.

735 BULKLEY BLDG. *CLEVELAND, OHIO*

twist on the fine frame because the heavy strand of roving on the slubber and intermediate would resist the pressure of the presser pad and let the twist escape.

"Wash" tells us that he's not in favor of any flyer that increases the pressure of the presser pad on the roving as, in the case of the bobbin lead frame, it will, he says, retain much more twist per inch, but will increase the unequal conditions, and it is the unequal conditions on the bobbin-lead frame that produce stretched roving.

"Wash" then quotes statements from an old friend of his who was at one time superintendent of a large shop building fly frames. This superintendent says that with all that has been said and written upon the subject of cones and their peculiarity in construction, and the theories pertaining to them, he has never seen where the authors have ever taken into account the pressure of the presser pad on the roving.

Summing up the foregoing it seems that "Wash" is of the following opinion: First, that a bobbin-lead fly frame will not do good work; second, that the presser pad produces the tension on the strand of roving as it is being wound on the bobbin; third, that this pad pressure is variable and must be accounted for in the outline of the cone diameters; fourth, that there is a vital relation between the outline of the cones and the speed of the frames; and fifth, that if the ends of roving on the frame are running too tight, the frame should be speeded up, and if the hank or number of roving is changed, the speed of the frame must also be changed to take care of the tension.

Now, with the forebearance of "Wash" and the other readers, I will attempt to reply to the questions raised by this gentleman in the order named.

First, the fact that a very large majority of modern mills now running are using the bobbin-lead flyer frame, producing the very top in quality of yarn, is positive proof that the bobbin-lead frame can make good roving.

Second, the primary purpose of the presser pad is not to produce tension nor to keep twist in the strand of roving. However, it does make a very slight tension on the strand. Its main object, though, is to condense the bobbin as a whole to a firm density, putting it in proper condition for further handling. The fact that the end goes through the top of the flyer, half around and down through the hollow leg, twice around the finger and through the pad, should convince any practical carder where the majority of tension is put in.

Third, there is no difference between the design of a bobbin-lead flyer and a flyer-lead flyer; they are made exactly the same in their several details, only that one is right-handed and the other is left-handed. They both operate under the same mechanical laws producing identically the same results. The builders of fly frames discarded the flyer-lead frame for the one purpose of getting rid of the weight of the full bobbins coming against the highest speed of the bottom cone which might cause the cone belt to slip, thereby giving trouble. All modern flyers and pressers, either bobbin-lead or flyer-lead, are designed to give a uniform pad pressure on the bobbin through the whole set. However, if it should increase or decrease in pressure during the set this increase or decrease would be regular throughout the set and therefore would be taken care of by the tension change gears.

Fourth, the make of the flyer, presser pad, or the speed of the frame, have absolutely nothing to do with the outline of the cones in any make of frame. In proof of this let me say that some of the best mills in this country are equipped with fly frames whose cones are all the same size for the different frames, that is, the cones in a slubber 12 x 6 running 600 r.p.m. are interchangeable with the cones of a 6 x 3 jack frame running 1,500 r.p.m. In designing cones for the proper winding of the roving on speeder bobbins, there are only two factors to be considered. First, they must have a ratio of speed high enough to wind onto the smallest bobbin while empty, and low enough to wind onto the largest bobbin when full. The second factor is that we must take into consideration that the thickness of the cone belt does affect the effective diameter of the cones.

Fifth, the more common size speeder cones conform to the following measurements: 30 to 36 inches long by 2¾ to 3½ inches in diameter at the small ends, and 5 to 7 inches in diameter at the large ends. Ranging in driving ratios from three to seven. When they are properly designed they will both be the same diameter at each end. And they will be the same diameter one-third of their length from starting end. Their correct outlines are calculated in the following manner: First, decide on the length and size of cones at each end. By adding together the difference in diameter of each cone, the combined difference in diameter of both cones will be secured. We will now consider that we have two pulleys 30 inches long and the top one the same diameter that we decided to make the large ends of the cones and the bottom one the same size of the cones at the small ends. Then we lay them off in divisions of even length, say 6, 9, or 12, or even a greater number, depending on how close together we want to know the diameters. If actually constructing, the closer the better for getting the outlines. As a trial we will use six divisions. There being six divisions, we will have seven different diameters. It will be understood that any and all reductions made on the top cone must be added to the bottom cone.

Having seven cone diameters as outlined above, we will now divide the combined difference of the cone diameters by one-seventh, and subtract this one-seventh from the top cone and add the same amount to the bottom cone. Subtracting this one-seventh from our first dividend will give a new dividend, which we will divide by one-eighth, adding and subtracting as before, following this process until we have divided by one-twelfth, this bringing us to the small end of the top cone. And was it not for the effect of the cone belt thickness, cones outlined in this manner would wind correctly on any size or make of frame, insofar as the cones enter into the problem. But owing to the effect of the cone belt thickness on the effective cone diameters, we must change either one or both cone diameters; in this case we will only change the top one, by adding the thickness of the belt at the starting point and one-half of the belt thickness at the end of the first division, making no change at the end of the second division, owing to both cones being the same diameter at this point, but reducing at the end of the third, fourth, fifth and sixth divisions in the following amounts: ⅛, 3/16, ¼, ⅜ and ½ the thickness of the cone belt. We now have cone outlines that will give entire satisfaction on any size or make of frame, whether bobbin-lead or flyer-lead.

In conclusion, let me say that after an experience of

QUALITY

Bondaron

Solid Round BELTING

BONDARON is made from the hide of a native steer of the Swiss Alps. The Swiss steer, let it be noted, is famous for an unusually thick, tough hide.

In a famous European tannery the hides are tanned. The process, a guarded secret, is far superior to oak tanning or any other method commonly employed. The hide retains its natural thickness and strength. Instead of stretching and slipping when put in service BONDARON round belting runs smoothly because the leather is thoroughly stretched in the process of manufacture.

You will instantly recognize BONDARON solid round belting because it comes to you with the natural hair of the steer still left on. Hides from which ordinary round belting is made are lime-dipped to remove the hair and naturally the lime does something more—it removes some of the natural strength of the hide. BONDARON retains its hair and likewise all its strength.

These are a few of the vital reasons why *all* your machines using solid round leather should be equipped with BONDARON.

It means profit to you through increased production, and a better frame of mind on the part of your operators because of less frequent stoppage to make repairs.

BONDARON Solid Round Belting reduces *SLIP*, *STRETCH* and *BELT HOOK* Problems to a minimum and as a result is guaranteed to be the most economical belt you can buy.

The following sizes are carried in stock: 3-16, 1-4, 9-32, 5-16, and 3-8 inch. **Special sizes quickly furnished to order. Write today for booklet.**

"The Leather With the Hair On"

Made Exclusively By

CHARLES Bond COMPANY

Importers and Manufacturers of

TEXTILE LEATHERS

617-619 Arch St., Philadelphia, Pa.

LEATHER

DRAWN-IN only one time and change to any cloth when you weave with

"DUPLEX"

FLAT STEEL LOOM HARNESS

STEEL HEDDLE MFG. CO.

GREENVILLE PHILADELPHIA PROVIDENCE

Southern Office

509 Masonic Temple : : Greenville, S. C.

Hampton Smith, Southern Manager.

N. B.—We are the sole manufacturers of Nickel-Plated Drop Wires for every kind of loom.

more than thirty years in the study and operation of fly frames, and the changing of many cones to conform to the outlines given, I feel pretty sure of what I have said, and if it is not clear to "Wash" and the other readers of COTTON, I would be glad to try to make clearer any point they do not fully understand. K. S. (N. C.)

What Causes Uneven Yarn?

EDITOR COTTON:

The causes of unevenness in yarns are so numerous and are so scattered over the manufacturing processes that it is practically impossible to remedy this great difficulty by simply putting a finger on one specific trouble and remedying it. There has been so much discussion on this subject lately, and southern mill men have evidenced such a strong interest in the possibilities of eliminating this great draw-back to successful manufacturing, that I am going to make an effort to trace out as many causes of unevenness as possible, and suggest some remedies, in the hope that my suggestions and experiences may be different from those of other readers having trouble with uneven yarn.

To start at the beginning, we must go to the cotton house, where the bales are received at the mill. Every bale that is to be sent through the mill should be watched carefully, to see that, as near as possible, an even staple is secured. If a mill is running 1 3/8 inch stock, and the machinery is hung up for that length of staple, a bale of 1-inch cotton should under no circumstances be allowed to go into the mixing; similarly, cotton of 1 5/8-inch staple should be kept from entering the processes. All cotton that does not conform to the staple desired should be set aside and, if possible, sold to some mill that is using that particular staple.

Next comes the opening room. It should be a rule to open just as many bales at a time as possible. Also, there is the waste problem to contend with, and if a mill has no waste machine in which to tear up the waste, a good way to utilize it is to mix it into the breaker with about two-thirds good cotton and run this through in a sheet, letting it run onto the floor in front of the machine instead of making it into a lap. This should then be taken to the mixing room and mixed with the cotton being opened.

A good way in which to work this proposition is to first put down a layer of cotton say six inches deep, scatter over this cotton a thin layer of the waste, and then add another layer of cotton, and so on. This should be kept up until the waste is all worked up. Those who have never tried this plan will find it a safe one to adopt.

In feeding the cotton to the hopper of the breaker picker, the same amount should be kept in the hopper at all times, and the operator should never be allowed to fill a hopper and allow it to run nearly empty and fill it again. The suggestion made by "J. H. Y. (Ga.)" in the October number for a "Thin Lap Preventer for Breaker Pickers," which was commented upon and improved by "C. N. S. (N. C.)" in the January number, is a very plausible plan, as it is best to keep the hopper about two-thirds full of cotton all the time, and this arrangement answers the same purpose.

The laps on the apron of the intermediate picker should be arranged so that they are of different sizes at all times. This will give a more even intermediate lap than would be the case if all four laps were put on the apron at the same time and allowed to run out at the same time This practice will also hold good on the finisher picker.

Other suggestions which might be made in connection with the operation of the pickers include not allowing the laps to vary over a half-pound either way; using good endless evener belts; keeping the feed rolls clean, as well as the screens. All lumps that collect around the screens should be cleaned off. The fan should be run at a speed just sufficient to allow the air current to throw an even sheet of cotton onto the screen. Too high a fan speed will cause too many motes to be carried into the lap, and a speed that is too low will cause much good cotton to drop through to the mote box. Pickers should be kept well oiled throughout. A good plan is to take out the feed and calender rolls and the screens on the machine every Saturday and give them a good cleaning until all the machines have been cleaned, and then start all over again. This will keep the machines in first class condition and allow them to properly perform their duties.

This brings us to the card, the most important piece of machinery in the process of yarn manufacture. I will begin by saying that a card should never be ground to sharpen it, but it should be ground *to keep it sharp*. It is a wise policy to get the best man possible to look after the cards, and pay him well, for good grinders are hard to find. He should be made to feel that he should take a pride in keeping his cards well set up. If he is sufficiently paid and encouraged, he will see that the flats are always set right, he will keep the doffer set close to the cylinder, the screens set so as not to throw out good cotton into the fly, the licker-in set close to the cylinder, and he will see that all other parts of the card—the front and back stripping plates, the feed plate and the mote knives, the doffer, the top combs, the gears, the lap roll—are all set right and kept in good condition. All of these are essential features in the card's work, and it is necessary that they function properly at all times.

A good carder will keep all the gears set so they will not skip. He will set the stripping roll stands so the roll will strip the card well, and he should allow the cylinder to fill up at stripping time before putting up the end. He will not allow any thick places in the lap to go through the card, and will not permit long lap piecing when putting on full laps and at stripping time. The sliver that runs into the can while the card is being stripped should be pulled up and the end pieced up again. The cards should not be fanned off; the proper way is to clean them with a good waste brush.

Next we come to the drawing frames or lap machines, both of which are very similar in principle. The spoons on these machines should be kept well balanced so that when a sliver runs out or breaks back the machine will knock off at once. Piecings must be watched closely, for here is the cause of a lot of trouble. One thing that should be prevented is having the machines started up and an end thrown over to the rolls; the tender should hold the end close to the roll so that when the machine is started it will go through at once. If allowed to be thrown over to the rolls, there is danger that it will not catch at once, and the chances are that it will be overloaded, causing a heavy place in the sliver at the front of the machine.

Good piecing is as important at the front of the ma-

BUCKEYE

FANS and HEATERS *for* HEATING VENTILATING DRYING CONVEYING

SERVICE

Buckeye Service, like Buckeye Equipment, is efficient and complete. Our Engineer will be glad to call and investigate your particular conditions and requirements, and advise with you as to the best equipment or system. He can solve your problem more efficiently and economically—the cooling, heating or ventilating of your mill—the elimination of vapor and condensation in your dye house—the drying of cloth, the conveying of raw stock, lint, etc.

Write us direct, or write or wire our Southern Office.

BUCKEYE BLOWER CO.

COLUMBUS, OHIO

BLOWERS, FANS and HEATERS.

Southern Office—372 Whitehall St., Atlanta, Ga.

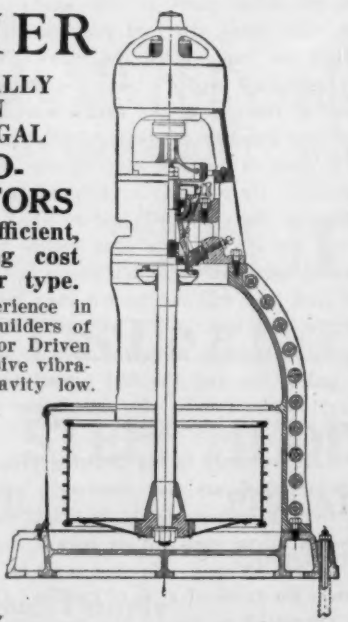
D'OLIER

ELECTRICALLY DRIVEN CENTRIFUGAL

HYDRO-EXTRACTORS

Faster, More efficient, lower operating cost than any other type.

Twenty years experience in Extractor work. Builders of the first direct Motor Driven Machine. No excessive vibrations, center of gravity low.



We also make underdriven type of machines. Our Engineering Department is at your service with its years of designing and building Centrifugal Extractors.

D'OLIER CENTRIFUGAL PUMPS
D'OLIER HYDRO-EXTRACTORS
BLAISDELL COMPRESSORS

Bulletins and detailed information upon request

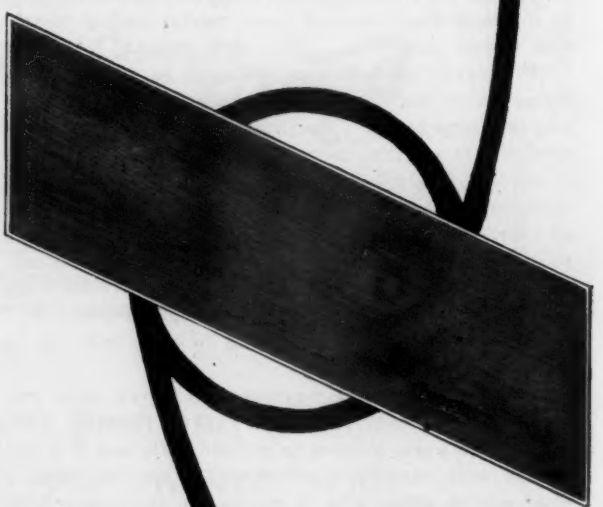
The United States and Cuban Allied Works Engineering Corporation

Works: Bradford, Pa. *Cable, Idolwax" New York*

Creo-pine Sub-Flooring

Outlasts the factory but costs no more than any first-class untreated, sub-flooring.

Affords uninterrupted production, eliminates floor repair costs, assures durability and top floor stability.



Creo-pine Sub-Flooring —is vacuum pressure impregnated with pure coal tar creosote oil.

Impervious to all deteriorating influences of rot.

"Timber Penetrated by Creosote Oil Will Never Rot."
Bulletin No. 14, U. S. Dept. of Agriculture.

Southern Wood Preserving Co.

Atlanta, Ga.

Station A

Manufacturers of Creo-Pine
Block Floors for Heavy Traffic Duty
Shingles that Never Rot
Fence Posts Assured Life 25 to 40 Years.

chine as at the back. The rolls should be kept well cleaned and oiled, and the clearers cleaned. The machine in general should be kept in first class condition, the rolls must be drafted properly, the trumpets all reamed the same size, rolls all weighted properly, and all knock-off motions kept working freely.

Combers should be kept well cleaned and oiled, rolls varnished, knock-off motions working freely, brushes set up well, cleaners cleaned, etc. Short piecing should be used when putting on full laps, and good piecing must be done on the tables and at the head or coiler.

Going to the roving frames, we will take up the slubbers, and give a few general rules that should always be observed in the operations of these machines. Some of these are as follows:

Rolls, guide boards and clearers should be kept clean, tension should not be too tight, flyers must be clean, backs brushed, spindles clean and well-oiled, bobbin and spindle gears should be set properly. Good even piecing should be used when creeling in full cans. The roving should be wrapped around the flyer pressers three times. The carriage should work freely, the lifting shafts kept well oiled, and the steel rolls kept clean. The rolls should be properly weighted and kept cleaned and well oiled. Gears must all be set so there will be no skipping or jumping.

Next come the intermediate and fine or jack frames, and what applies in one case will apply in the other also. Here, too, the rolls must be kept well cleaned and oiled, clearers cleaned and guide boards wiped. (In making fine yarn this should be done at doffing time.)

Spindles and flyers must be kept clean, carriages cleaned and the tops and bottoms of roving skirts taken care of properly. All broken skirts should be replaced with new ones. The backs of the frame must be kept clean, as well as the bobbin and spindle gears. They should also be correctly set.

Doublings and singlings must be pulled off, and good piecing done when creeling. No long ends should be pieced together, but pieced together very close to the end that was broken to creel in a full bobbin.

The tops of the creel must be kept cleaned off, all drafts kept right, change gears made to work freely, bolsters cleaned and oiled, belts made tight so that there will be no slipping. An endless cone belt should be used on the machine, and kept in good working order. The lifting shafts must work freely and be kept well oiled.

Steel rolls should be kept clean and a good lubricant used in the stands. Ends that break back should be kept up. The frames should be given a general overhauling once a year.

The guides should never be fanned off; they must be wiped out and cleaned with a good waste brush. Roving should always be pulled or twisted off when creeling. At no time should it be allowed to be cut off the bobbins.

Now we come to the spinning frame. This should be watched after carefully, for bad running here seems the ruination of the yarn at the very end of the journey. In my opinion, the boss spinner should not try to place all the blame on the carder as he will have plenty to do in keeping the yarn even after it gets to his room.

In dealing with this process, I am not going to continue the practice of following the stock through the machine, as I have done with the preceding processes, but will only give some of the troubles that will cause unevenness in the spinning room. Some of these are: Lint being allowed to collect on top of the creels; waste allowed to gather around top and bottom of skewers; broken creel steps; skewers in bad condition; long piecing when setting in full roving; skewers set down into creel boards, causing more friction on the roving; roving rods improperly adjusted to travel the proper distance; roving guides partly filled with waste and in bad condition; spinners being allowed to fan off the frames; improperly covered rolls; leather covered rolls not having the same diameter; rolls put on with laps running the wrong way; rolls not properly cleaned, oiled and adjusted, and with improperly placed saddles (this will have the same effect on roving frames, also.)

Other causes for uneven spinning are: Allowing a lap on one end of the steel or leather rolls while the other end of the same roll is running; leather and steel rolls not cleaned; worn necks and flutes; loose fitting joints; bent rolls; too much draft; worn out travelers; worn guide wires not properly set; loose rings; waste or loose lint on separators; spindles out of center, and so on *ad infinitum*.

The foregoing are merely some of the simple troubles in the spinning room. They are things that are very easily remedied, and may often seem of no consequence to the spinner, but they quite frequently are what causes the yarn to be uneven, and oftentimes a correction of things like these will improve the work considerably. The superintendent or overseer always takes an interest in something that seems of very great impotance, and yet it is frequently found that they will let the little things go by, and it is the combination of the little evils that produces the greatest difficulty, and one which is generally the hardest and most troublesome to overcome. In cotton manufacturing, with its many doublings and drafts, a molehill can literally become a mountain ere the end of the work is reached and therefore we mill men should apply ourselves to the task of setting these small things aright; then, after we know they are right, we can go about making some of the major changes and improvements.

Ted (N. C.)

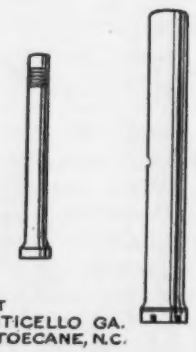
Making a Gain in Efficiency.

EDITOR COTTON:

The marked increase in efficiency, management and operation that has been made possible in cotton manufacturing has not been universally adopted by all mill managers of the present time, and today there is more fault-finding in this industry than ever before in all its history.

Let our thoughts drift back thirty or forty years, and we find that in those days much more attention was given to mixing the cotton than this process receives in the majority of the mills in this country today. In those days we were told, as we are told now, that before the cotton is presented to the opener it should be broken up in small pieces and built in layers so as to blend every bale mixed. The only difference between those days and the present time is that then every mill followed this rule to the letter, while at the present time it is ignored by most mills, including some of our most modern plants. Often one will find that the room for mixing is entirely eliminated.

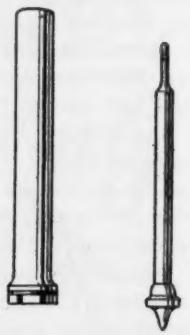
This was the first mistake, but the greatest mistake made



JORDAN
MANUFACTURING COMPANY
BOBBINS

MILLS AT
MONTICELLO GA.
AND TOECANE, N.C.

MONTICELLO, GEORGIA



COTTON MILLS SHOULD USE Commercial Acetylene For Welding

Supplied in portable cylinders on loan basis without deposit.

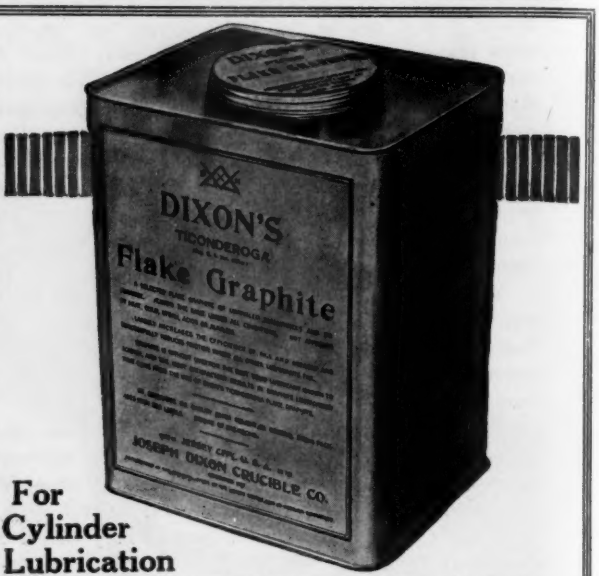
Only the purest gas can safely be trusted to meet the exacting demands for cotton mill welding repairs. Commercial Acetylene is a gas of absolute purity.

WRITE FOR OUR SERVICE AGREEMENT

Commercial Acetylene Supply Co.

204 Trust Company of Georgia Bldg., Atlanta, Ga.
Main Office: 80 Broadway, New York City
203 S. LaSalle St., Chicago

Aurora, Ill. | Boston, Mass. | Bound Brook, N. J.
East Deerfield, Mass. | Toronto, Ont. | San Francisco, Cal.
Moberly, Mo. | Berkeley, Cal.



For Cylinder Lubrication

DIXON'S TICONDEROGA in the cylinders of your engines and compressors will result in a two-fold benefit to you; lower lubrication costs and improved operation. When surfaces are well graphited very little oil is required and most of the usual cost of lubrication can therefore be saved. Manufacturers of graphite lubricators guarantee an economy of at least 50% over old style lubricators.
Investigate lubrication by means of graphite. There's a Dixon Grease or Graphite for every purpose.
It is in fact—an economic fact—that Dixon's Lubricants are better and cheaper than other lubricants.

May we send you proof,
and our Booklet No. 34-C?

Joseph Dixon Crucible Company
Jersey City, N. J.
Established 1827

"ATLANTA" HARNESS

"Quality and Service That Satisfies"

ATLANTA HARNESS & REED MFG. CO.
123 WALKER ST., ATLANTA, GA.
P. O. Box 1375
Telephone Main 517

50% Better than ever from YOUR Standpoint

SEVERAL NEW FEATURES

have been added to the "1912" Cloth Cutting, Folding and Winding Machine which add at least 50 per cent to its value to YOU.

It will cut your cloth—fold the edges—roll it up and give you an exact measurement of every piece of cloth going through the machine.

It saves time, labor, machines and cloth.

YOU ONLY NEED ONE MACHINE where before it required two, and you get an extra strip from each bolt of cloth.

It cuts the corners of expenses in every way and leads to more and greater profits.

THE ENORMOUS SAVING WILL INTEREST YOU.

Mail a card for complete information and prices.

When in need of special machinery, write us.

J. A. FIRSCHING, 614 Broad St., Utica, N. Y., U. S. A., Dept. "C."

in mill equipment in the past thirty years was done when the Creighton opener was ostracized. Then, as now, I fought hard with my pen to retain that most efficient machine. What was the result? Mill men are realizing these two mistakes, and to overcome the former method of mixing, Creighton openers are used in tandem, which proves that this machine does not give the cotton a severe treatment as we once thought.

The object of all the manipulations in cotton yarn manufacture is to produce a thread prefectly cylindrical in form, without variation in its thickness and with as many fibers as possible in its cross section, but we are surely going away from this principle when the bales are not blended.

As I remember the old type of Creighton opener, the machine consisted of a conical beater secured to a number of arms. The length across the points of the blades decreased from 33 inches to 18 inches, the smallest diameter being at the bottom. These blades revolved in a case known as the grid, which was also conical, in exact proportion to the decrease in the diameters of the blades.

The principal picking machinery now used in most mills, taking these machines in the order in which they are used, are the following: bale breaker, automatic feeder and breaker, intermediate lapper and finisher lapper. The old equipment of thirty or more years ago used the following machines: Creighton opener, scutcher as it was called, and the finisher lapper.

Let us study the difference between the Creighton opener and the automatic feeder and breaker of the present day. In the Creighton opener, the cotton, when brought within range of the action of the revolving blades, is struck and flung against the conical grids. The heavy impurities have a better opportunity to drop to the bottom of the case than on the type of beater boxes at present in general use. This advantage of the Creighton opener should be easily seen, owing to the great area in which the cotton is carried as compared with the area in the other type of beater box; and besides, in the Creighton the air currents can be regulated to a better advantage because of the rise of the stock, and also due to the impurities being heavier than the fibers.

In the type of beater box in general use today, we are unable to allow the cotton to be carried around a second time, owing to the cotton receiving a second beating which would injure the stock, and again, in case of an overworked beater, disastrous results would follow. The stripping plate found on all pickers proves these facts.

With the Creighton opener it is different, because the cotton can play between the blades of the beater without being struck, and at the same time the heavy impurities are given a good opportunity to drop to the bottom of the case. The grids in the Creighton opener beater are made with raised surfaces, against which the cotton is struck, and between each pair of grids an opening exists through which the dirt can be easily extracted.

The distance from the points of the blades and also the inner surface can be so adjusted that the cotton cannot be drawn upwards too rapidly, yet on the other hand they can be adjusted to regulate the amount of impurities to be extracted.

Visit any waste mill, and the cards will be found equipped with the duplex carding system and a fancy in front of the cards, and the yarn cleaned with yarn cleaners. Stop here and study the lack of efficiency by those mills not using the Creighton opener in tandem. In fact, I want to predict that the time is not very far off when all mills will be equipped with Creighton openers in tandem.

The article entitled "The Tandem Use of Creighton Openers," by James Robertson, which appeared in the April issue of COTTON, is worth reading twice by all mill men. Mr. Robertson is dead right when he says in the first paragraph of his article, "But its cleaning effect, its thorough airing and quick conditioning of the cotton, its opening qualities, have been only partially appreciated." No mill man can deny these facts, for twenty years ago, few mills had any use for the Creighton opener.

The cotton received in the Creighton opener is carried around in a much larger area or field than that in our present type of beater boxes. It, therefore, follows that the impurities have a better opportunity to leave the tufts of cotton than in the present system of picking, with less beating, which means less injury to the stock.

Strippings or waste is hard to work, for the reason that the fibers are not so coherent and besides, the fibers are lighter than when in a raw state. Think what an advantage this feature would mean to all the waste mills.

One good feature that is sometimes overlooked in the Creighton opener is the efficiency of the beater blades. The blades strike the cotton more fully than those in the type in present general use. To get a clear understanding of the matter, let us consider the passage of the cotton through the Creighton beater, and then consider the passage of the cotton through the automatic feeder and breaker in our present system of picking.

In the Creighton opener, the cotton is fed through a tube, drawn onward and delivered within the range of action of the beater. This is accomplished by means of a fan placed immediately below the tube through which the cotton is fed. The difference in the two machines should be noted at this point, because the cotton is not held by a pair of rolls, or plates and roll, as in the present type of picking. Thus, the cotton, when passing through the Creighton opener, is free at all times, but of course under the influence first of the fan and then of the beater. But the point I wish to convey is that the cotton receives a better cleaning without being struck 50 to 60 blows. In some mills today this number of blows is exceeded. In the Creighton machine, the speed of the beater never should exceed 700 r.p.m. At the present time there are some mills where the speed of the picker beater is 1,600 r.p.m.—and no doubt this is one cause for fault finding.

Mills that are using the Creighton opener have little trouble, which proves that the picking system without this efficient machine is all wrong. With the Creighton opener, besides the stock being better cleaned without a severe beating, it follows also that it is not necessary to have the beaters in the succeeding machines revolve at such a high speed, which accounts for the greater strength found in yarn made from this system of cotton preparation.

With the automatic feeder and breaker system, we find the cotton being brought forward by a steel roll, every inch being held until a certain number of blows are struck, and here lies the chief difference in the two systems. Can more impurities be taken out from a bulk of cotton that is sup-

BLEACHERS!

—SATISFACTION—

By turning out goods to satisfy
the consumer you also satisfy
your Selling Agent.

The consumer wants
White Goods that stay white
—and strong—, and you know
they can only be produced
at same cost by
Peroxide Bleaching

THE ROESSLER & HASSLACHER CHEMICAL CO.
NEW YORK

ported by a steel roll, or from a bulk that is supported by an air current?

Many carders will say that the Creighton opener had to give way to the automatic feeder because these boxes feed to the breaker more evenly than the Creighton machine, but at the present time Creighton openers are equipped with automatic feed boxes.

I have lately visited many cotton mills, and every mill man is crying "Poor stock" and "Weak yarn." But what about the mill equipment?

There are two systems in most of our cotton mills that are dead wrong. The first is the picking system, as discussed in this article. The other is the bobbin-lead system on fly frames.

All waste mills should adopt the use of Creighton openers in tandem as soon as possible. Waste mills have lost their market owing to the nebs and dirt found in the waste yarn. The supreme prayer of my life is that I may live to see cotton mills equipped with Creighton openers in tandem and flyer-lead fly frames. Then we can equal and use the yarn breaking tables of long ago. Wash (Mass.)

A practical booklet discussing "The Care of Raw Hide Drop Box Loom Pickers," has been issued by the Garland Manufacturing Co., Saco, Maine. This booklet was prepared for the purpose of giving the cause of and prescribing the remedy for unnecessary—and therefore preventable—wear of raw hide drop box loom pickers. It takes up those cases which occur most frequently, such as excessive wear on the back of the picker by the stick, the results of a worn picker stick, the shuttle picking out of the center of the head, unusual wear at the end of the spindle hole on the front of the picker, the catching of the shuttles and pickers in the box, etc., all of which bear not only upon the durability of the picker but also upon the quantity and quality of the loom's production. For each difficulty discussed, a remedy is given; the text matter is prepared in clear, understandable style, and drawings are used to illustrate the particular points being discussed. This booklet is now ready for distribution and will be sent to any mill men interested upon application to the company.

That Chinese Mill Problem.

EDITOR COTTON:

In his letter in the May issue of COTTON, "A Chinese" states that "this is not a Chinese puzzle," however, he has, unconsciously perhaps, really given us a puzzle. In the fifth paragraph he states, "All rolls were set for 7/8-inch staple, and the third drawing frames were omitted." Now in the first place, I would like to know how the first and second rolls on any spinning frame can be properly set to run 7/8-inch stock? The front roll is never smaller in diameter than one inch, and the second 7/8 inch. Adding these diameters we have 30/16, so their radii together total 15/16 of an inch, so we have one inch space from center to center, which is 1/16 of an inch over the length of the staple, which is too much.

We understand that the writer of the letter in question hasn't the power to make changes in the mill given to him, and to my judgment, it is a good thing for the mill that he hasn't the power. All practical mill men know that 1/16-inch space over the length of the staple is too great. Of course, when using 7/8-inch staple, we are as helpless as

our friend from China, but why state that all rolls were set for 7/8-inch staple, when that is an impossibility?

Again, he would have us accept as a pointer that omitting the third process of drawing is beneficial to the making of a stronger thread. Here he is dead wrong, in my opinion. From the birth of the cotton industry, the slogan has been, "double at every opportunity." The idea is the same as running single and double roving. Double roving will make evener and stronger yarn than single roving.

In the sixth paragraph of his letter, "A Chinese" says, "Besides, the rolls of the drawing frames, which are metallic, cut the fibers more severely with the higher speed." From this it is to be assumed that he has much to learn about metallic rolls. This is the first time that I have ever seen in print that the speed cut the fibers. No doubt, "A Chinese" intended to say "web" instead of "fiber." However, it is impossible to cut fibers with metallic rolls, for the reason that the grip on the fibers is equal only to the pressure it takes to revolve the top roll, which, it will be admitted, is very slight.

But let's assume that the web was cut instead of the fibers. Metallic rolls run on collars, and high speed will not cause them to jump as in the case of the common leather rolls. Here's why: When metallic rolls are run at a very high speed, a trumpet with a slightly smaller bore should be used. To give a better idea of what I would like to convey, let us assume that a drawing frame is run at a very low speed, and that a small lump of foreign matter is drawn to the trumpet; in most cases, the web breaks, but if the speed is doubled, the impetus draws the lump through the bore and the web is saved. So, when the speed was changed from 470 r.p.m. to 300 r.p.m. more resistance was given to the fibers passing through the bore with the result of a more perfect web.

In my opinion, "A Chinese" has the wrong idea concerning beating, although while I have always advocated less beating in the picking process, it must be said that a beater speed of 1,000 r.p.m. is not too great.

Again, he would seem to have us believe that it is possible to run the beater and fan at the same speed. On all pickers, the "air current" must carry only the cotton fibers and deposit them onto the cages, and at the same time the heavier impurities must be permitted to fall through the grid or grate bars. If, then, it is found that too much good fiber is deposited with the waste "droppings" under the beater box it may be attributed to either the beater revolving too quickly, the grids being set too far apart or the speed of the fan being so slow as to cause a weak current of air and thus failing to carry the fibers away before they were permitted to fall between the bars. On the other hand, if the lap from the machine contains too much seed, leaf, etc., the causes may be directly the opposite from the foregoing; that is, the beater may be revolving too slowly and failing to thoroughly open the cotton, or the bars may be too close together, preventing the impurities from passing between them, or the fan may be running at too high a speed and creating an "air current" sufficient to carry the heavier impurities with the cotton in place of allowing it to fall out while passing over the bars.

From the foregoing, it should be clearly seen that it is impossible to run the beater and fan at exactly the same speed. It may be possible in some cases, but in all my practical mill experience I never saw a place where the speed of the fan equalled that of the beater. In the first case, "A Chinese" has a speed of 1,100 r.p.m. for the beater and 1,100 r.p.m. for the fan. Impossible! Any practical picker man gets results by a variation in speed of the beater and fan as stated.

Oh, no! The trouble was not in excessive speed; to my mind the trouble was remedied through good luck, not through discovering the cause.

I hope "A Chinese" will accept all this in the right spirit, for my only aim is to help every reader of this department. Take apart every statement I have made and see if I am right. If I am not, tell me about it.

Wash (Mass.)

The Use of Scheduled Costs.

(*Continued from page* 706.)

of cost may be passed by with no comment, other than that careful and standard schedules of direct material requirements must, of course, be maintained.

The direct labor cost of each and every item is figured on the basis of the standard time which should be consumed by each operation in producing each item, extensions being made at an adjusted standard rate of pay for each operation. In adjusting this portion of the scheduled costs, it is necessary to establish first the proper method of performing each operation, naturally involving the selection of the best equipment which can be used for the operation. In place of this it is often best to use a mean average of what time would be required as between the best and the poorest pieces of equipment which may be used.

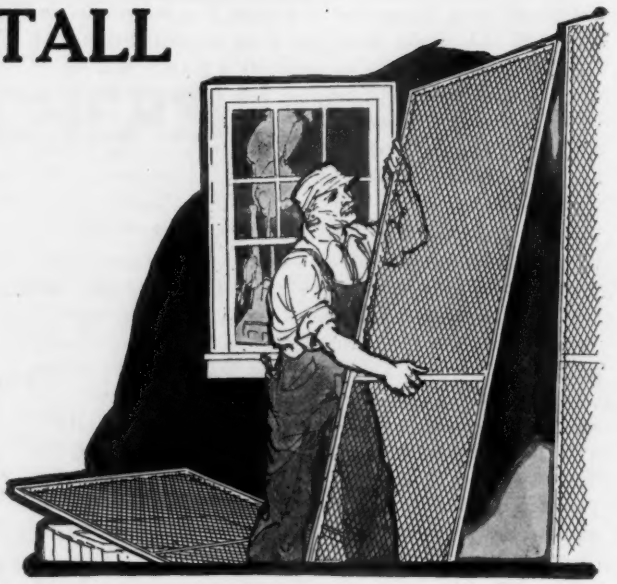
This feature, coupled with the necessity of establishing standard or average rates of pay for the workers, necessarily introduces an element of uncertainty, which, while by no means nullifying the value of setting the standard costs, tends to establish such standards on the basis of average rather than actual performance. In dealing with standards, the most successful results can be obtained only upon establishing a check upon the attainment of the standards as close to the actual time of performance as is possible. By this is meant, that if it has been established that a certain piece of material should be passed through an operation at a standard rate of three pieces per hour, the most valuable method of assuring the holding to this standard is to know as soon as possible after each hour has elasped whether or not this speed of three pieces per hour was actually maintained. This constitutes the use of what is known as the standard hourly rate of production.

Let us picture in our minds that we have all the operations to be performed on all pieces of material to be manufactured analyzed in this same way, whereby we know how many pieces should be produced under each operation in each productive hour. At the same time we also know in connection with this standard rate per hour the best equipment to use to maintain this production; and we also know the exact tool equipment to be used. With such information we are fortified with all details which enable us to maintain a very close control of all the operations which are being performed in the plant, which, if properly exercised, is bound to produce results of great magnitude in the speeding up of production and the maintaining of the standards which have been set.

SO EASY TO INSTALL

Famous for their simplicity of installation. Can be adjusted to varying conditions or moved quickly. No cutting, drilling or additional material required.

Standard units include gravity or swing gates and wickets. Ready for immediate shipment.



Knapp Standard Wire Partitions

Some of the many uses:

Tool cribs, stock rooms, shop restaurants, wash rooms, factory offices, passage ways, locker rooms, etc. No interference with light or circulation.

KNAPP FENCE

Let Us Save You Money on
Window Guards, Skylight Guards, Factory Guards, Factory Fence, Factory Gates, Etc.

Attractive Opportunity For Live Sales Agents. Write for Particulars

Send Sketch or Dimensions for Details and Prices.

THE KNAPP FENCE CO., EAST 134th ST., CLEVELAND, OHIO

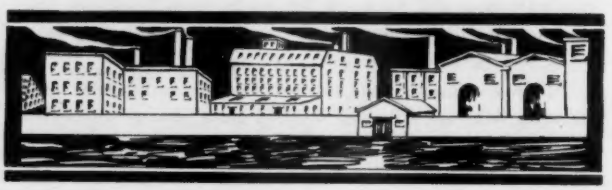
GARLAND

NOT A TWISTED EYE
In "GARLAND"
Cabled Twine Loom Harnesses

Our experience shows that for all ordinary weaving, cabled twine loom harnesses weave best and wear longest. This twine is hard to knit and difficult to finish but our harnesses are so carefully made and so thoroughly inspected that every cabled twine harness which we send out is smoothly finished and free from twisted eyes.

G TRADE MARK

GARLAND MFG. CO.
SACO, MAINE



Warren Soaps

Preferred Stock

The best quality tallow, palm, and red oils and olive foots, carefully balanced with the purest chemicals for your special purpose.

Uniformity guaranteed by test before shipment.

Warren Soap Warren Service

Warren Soap Mfg. Co.
Established 1870
77 Summer St., Boston, Mass.
Incorporated 1890

An Old Timer Says—

(*Continued from page* 707.)

The management of the mill had accepted this explanation because they had confidence in the superintendent and he really was a good manager and had made quite a success as an overseer of weaving. Then, finally, for reasons not necessary to explain here, another superintendent took charge of this mill. After he had been there long enough to get thoroughly familiar with all the departments and had gotten pretty well acquainted with the overseers, he decided to make his warp one number lighter in order to be able to help out that 44s filling in the spinning. He fully realized that to make the warp lighter would probably cut the production per loom, but he reasoned that if the production per loom was cut some he could start up part of the 150 looms he had stopped, which would enable him to get the pounds through the weaving.

There was so much more warp per square inch than filling per square inch in the dobby patterns that one number of warp was equivalent to about 2½ numbers of filling. Many of his patterns had four to six thread cords in them, and this called for 3500 to 4000 ends in some of his warps, which explains why one number in the warp was equivalent to about 2½ numbers of filling.

When his lighter warp got into the weave room he was enabled to greatly increase his filling spinning production by heavying up and taking out twist. You know that when you pass 40s filling on ring spinning frames, using about good average one-inch cotton, the front roll speed is reduced more in proportion than it is reduced in going from say 39s to 40s, so you can imagine about what his front roll speed was on 44s filling.

To make a long story short—he soon had one hundred of those looms running and the decrease in production per loom was not perceptible. Those one hundred looms were giving him over 3000 pounds more production per week, and the management was naturally "tickled to death" with the new superintendent.

The other superintendent would never have consented to making such a change for fear of tearing the weave room all to pieces, while the new superintendent took the broader view that if he *did* reduce production per loom some, he had looms stopped that he could start up to take care of that and in the meantime, he would be increasing the total production from the mill.

One other point was brought out that he had not figured on when making the change. The filling spinning had always run so badly that he was always short of spinners. This change fixed that to where he was on a par with the other mills in town and this enabled him to get in so much better shape that he soon had all the looms going and his reputation was made. The very fact that his total production increased considerably over 3000 pounds per week proves conclusively that his production per loom was not hurt badly, even if some of the boss weavers who read this claim the contrary.

Be careful, Mr. Superintendent, that you do not let the department from which you were promoted have too much advantage and work an injury, not only to your mill but to your job.

Some men really learn to grow, while others merely swell.

The Employment Manager.

EDITOR COTTON:

The discussion which has been appearing in COTTON on the different methods employed in different mills for hiring and firing help, and on the advantages and disadvantages of an employment manager, is very interesting. I have worked in a mill where every operative had to come from or through the employment office, and in this instance the practice proved to be a trouble-maker for all the overseers and other foremen in the plant. It caused no end of trouble, and resulted in a homogeneous mixture of help, some of whom had never been in a mill before. These people had to be trained at the mill's expense, causing bad work and discontent among the other workers. But as they were sent in by the employment office the overseer was the "goat" and had no voice in the matter.

Many a time if I sent for a twister-tender they would send me the first man who said he understood twisters regardless of whether he did or not. This is the truth, and furthermore, I've sent many a good twister-tender to the employment office, recommended by me for a job, only to be told that somebody else had the position. It was a matter of the early bird getting the worm. That old adage might apply to some things, but in regard to skilled labor, some consideration should be used by the employment manager, for the benefit of the mill, the overseers and the foremen in charge.

I'll admit that there are advantages in having an employment office, but if it is such a help, why is it that every mill hasn't got one? To my mind, the advantage is negligible when compared with the disadvantages. It does not improve production—far from it—but it does give the help a better chance of the positions, as in some mills there are foremen who are hard to get along with, and do not know how to manage help. To my mind, here is the only place where an employment office is a help to the mill.

On the other hand, there are numerous instances where an overseer or one of the workers knows of a good worker who would like to work in the mill, but who is barred by the employment office for some reason or another, although he might be recommended highly by the overseer of some department.

Here is an illustration. There was a young man working in one of the four mills of this firm as twister-tender, and being desirous of changing from No. 2 over to No. 4, he got through on Saturday and on Monday started in over at No. 4. The overseer in charge never asked him if he had worked for the company before, or for any other firms, but took him on his word that he was a twister-tender, only to find out later, to his sorrow, that he was far from being one. He kept this young man for a few days, but finally had to let him go.

The reason this man made the change was because No. 2 mill was running on fine work, and as they paid so much a hank, he could not make as much wages as in the No. 4 plant which was running on coarse work, which meant more hanks and more pay. But this work also required a good twister-tender, and this man was found wanting.

This is where the employment office would help the firm, by knowing the reason why this man left and the moment he started working Monday morning, and by keep-

ing the help in the proper rooms or departments or out of the mill.

No overseer likes to have his help constantly changing from one mill to another, seeking better and more wages. It is a bad practice and it keeps the men in charge of the different departments shifting the help around day after day.

The foregoing example is an instance where an employment office could be put to profitable use, and here is another one.

Sometimes there are cases where for some little thing concerning either the mill or an outside matter, the overseer will "ride" a certain man or woman worker every time he has a chance, and will fire him or her at the first opportunity. But what excuse could he give the employment office when he sends in a discharge slip? Assuming that the worker in question is a good capable operative, the mill would suffer by this move of the overseer, though the mill does not care about what happens between the workers outside its gates, as long as when they enter the mill they perform their duties properly and work for the interest of the firm. If an overseer discharges a person under these conditions, then the operative can state his case to the employment office, who can look up the matter and try to smooth things over. But I have seen and heard of cases where the employment office manager turned a deaf ear, and nine times out of ten the mill would suffer just because the overseer happens to be a friend of the employment manager.

It is a good practice for an overseer to have only one friend in the mill gate, and that should be the one who provides his "bread and butter"; he should treat all his help alike, whether young or old, man or woman, with malice toward none, and justice to all.

Some men just naturally know how to manage help, and they get all there is out of them without a complaint. Others, however, get hot-headed, jump at the least little thing that might go wrong—and the rest is familiar. His help becomes a group of dissatisfied people, and they don't care how things run or turn out, just as long as they can put in their time and draw their pay.

And then this overseer will wonder why it is that so-and-so never gets called on the mat to hear about a complaint or bad work. The days of slavery are over, and the sooner some overseers study their help and find out how to manage, the better work and larger production they are going to get—and the mill will profit by it all.

The employment office is a disadvantage to some overseers, as it prevents them from securing some first-class help they would like to get. Owing to the authority of the employment office, the overseer has no voice. But on the other hand, the office might be a life-saver, as some overseers do not know how to manage help, and with the office in charge, they cannot fire and hire help as they please without giving a valid reason for the action to the office. Here is where Mr. Overseer has to use some judgment, even if it is for the first time in his career.

Here is an actual example of where the employment office would be out of place and unprofitable to the mill.

A certain mill in Massachusetts was started up with the intention of running three shifts. It already had its first and last shifts, and was getting the second shift together. The right and only way of building up this second shift was, of course, to take a few hands from the first and last shifts and get a foundation upon which to start. However, the overseer knew little about handling help, and the employment manager knew less, so when they started to hire the help for the department in which I was interested any person who could answer "Yes" to the question "Are you a twister-, spooler- or warper-tender?" got the job, regardless.

It was a sight to see them come in the room from the employment office, stare at the ceiling and motors and different belts. Then came the task of breaking them in on the different machines. I was second hand at the time and stayed in night after night teaching them first how to start and stop the machines and then showing them different things about the jobs. Some were men who look toward the mill when the snow falls, others were attracted by the wages paid—but, all put together, there wasn't three per cent who were trained help.

I stood this for a long time, because the overseer didn't care. All the help was placed in the care of the second hand, but I could not pick out my men to suit myself. This kept eating into me until I made up my mind that if I ever had a chance I would organize the three shifts my own way, whether I lost my position or not.

"All things come to him who waits," and my chance came in the form of the overseer's being taken sick and kept at home for three weeks—just enough time for me to put my ideas to work, and take it from me, they did work, and are at work even to this day.

I went around picking some hands from the first and last shifts and put them in the second shift as a foundation. Then there were some changes made in my third-hands or fixers so that they lent a hand in putting the second shift on a good working basis before the overseer came back. When he did return he was surprised to see new faces on shift No. 1 and the first day, when shift No. 2 was started to work after he came back. He also missed the confusion formerly caused by the help's not knowing where to start. Everything was like clockwork—twister tenders at their frames, doffers at the sections with trucks and bobbins ready for the first frame to stop for doffing, and all the other help were stationed at their posts, each one knowing how and when to perform his duty.

The employment office did not know anything about what was being done until I had the three shifts re-organized and the slips were sent in and records made and kept. The scheme still holds good, thanks to Mr. Overseer getting sick—I was sorry for him, but it was all for the best.

The reader can see the advantage and disadvantage of the employment office and apply it to his particular case. As I have stated before, it makes a good deal of trouble for an overseer and is a loss in some mills, but in other cases it solves the problem of some mill superintendents as to "Why does so-and-so discharge so much help?"

I once saw a young chap lose his job as sweeper, solely because he talked back to the overseer. The reason was that the overseer asked the boy to give him a chew from his plug, and the boy replied "Go buy your own."

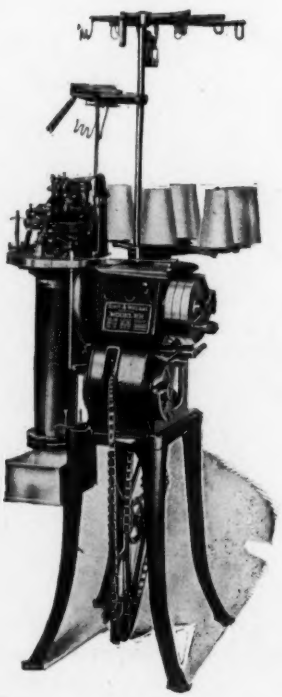
There are a lot of cases like this, such as the overseer saying "Go over to my house and saw some wood, or cut my grass" and if the boys refuse they are certain to lose their jobs. It is in such cases as these that the employment office is a help.

T. A. B. (Mass.)

KNITTING SECTION

NEW MODEL H-H

Producing Ribbed Top Half Hose Complete



Ribbed top made on two sets of needles.

Automatic transfer from ribbed stitch to plain.

Eliminating necessity of skilled help.

Saving of raveling waste which occurs when topped by hand.

Each stocking is dropped from the machine when finished.

Each stocking is automatically started upon the empty needles, producing a French welt without drawing thread or cutting, no ends of any kind to be removed.

Machine is fitted with five yarn fingers.

Provision is made for high spliced heel and double sole.

Provision is made for ring top and ring toe.

Speed of machine about the same as Model K.

Production about twelve stockings per hour on 3¾" 220 needles.

One operator can take care of the same number of machines as Model K.

The machine is built in all gauges.

ESTABLISHED 1865

SCOTT & WILLIAMS

INCORPORATED

366 Broadway **New York**

Hamilton, Ont.
Main and McNab Streets

Charlotte
1006 Realty Building

5% to 20% Increase in Loom Efficiency

And that is only part of the story when filling yarns are prepared for weaving by

"UNIVERSAL" WINDING

Add to that a 2% to 3% increase in spinning production and a marked decrease in doffing expense.

Still the story isn't told.

Now visualize the elimination of the major part of your annual yarn waste.

And you haven't come to the end of the story yet.

Send for one of our winding engineers to come and give you complete detail with particular reference to **your** mill. Write today, stating the time best suited to your convenience.

UNIVERSAL WINDING CO.

BOSTON

Providence
Chicago — Utica
New York

LEESONA
REG. U. S. PAT. OFF.

Philadelphia
Charlotte
Atlanta

With the Knitters at Signal Mountain

For the discussion of a number of matters of great importance to the members, a joint meeting of the southeastern and southwestern divisions of the National Association of Hosiery & Underwear Manufacturers was held on Friday, June 23, on Signal Mountain, the famous resort near Chattanooga, Tenn. Between forty and fifty members were present, and John Nash McCullaugh, consulting industrial manager of the Association, was present from the New York headquarters and spoke briefly on the subjects of the meeting and the plans and aims of the Association.

The chief subjects dealt with by Mr. McCullaugh were those which were discussed at the annual meeting of the parent Association in Philadelphia in May, viz., the adoption of a standard method of measuring hosiery; the question of terms with jobbers; the plan for the reduction of the number of white goods manufacturing sizes from six to three numbers; the matter of uniform and fair labeling of knit goods; and the much agitated proposal for a merger of the various textile associations under one governing body, to be known as a Supreme Council.

These matters were taken up separately by Mr. McCullaugh, and the members of the southern groups, collectively and individually, gave their hearty approbation and support of the work done and contemplated by Mr. McCullaugh.

The meeting consisted of one session and a luncheon, and was presided over by R. E. Davis, of W. B. Davis & Son, in the absence of Frank L. Miller, Jr., the regional vice-president of the southwestern division and J. F. Taylor, of the southeastern division. Mr. Davis read messages from these gentlemen, expressing regret at their inability to be present, and Mr. Taylor, in connection with question of terms, sent the following advice: "Hold terms to not over 30 days; we should not furnish capital for jobbers." A telegram from T. H. Johnston, former president of the Association, was also read.

Chairman Davis then presented Mr. McCullaugh, who, before getting down to the subject of the meeting, paid a tribute to the southern divisions for the support given the National Association. Mr. McCullaugh first took up the question of terms, advocating the adoption of 2-10 net 30 days as the terms for jobbers. "Following this telegram of Mr. Taylor's," he said, "I will state for the benefit of those who were not at the convention in Philadelphia that two groups of representatives called upon our executive committee—one from the Southern Wholesale Drygoods Association and the other from the National Knit Goods Buyers' Association—and they asked us to recommend that we return to a pre-war basis of selling goods to the jobber at 2-10-60 extra. This we refused to do. The idea that we are going to return to a pre-war basis on anything is out of keeping with the times. Our labor, representing 90 per cent of the cost of our finished product, has learned to live, and they will never return to a pre-war basis. The jobbers, when they asked this, had no reason for it other than they said 'We cannot carry the load.' If the jobber cannot carry the load he is not doing his share in the economic structure. The jobber is supposed to carry the mill.

"Furthermore," continued Mr. McCullaugh, "an extension of terms today means just one thing—the thing that we certainly do not want—it means more distressed goods. Any man who formerly sold on a basis of 2-10 net 30 and attempts to sell 2-10-60 extra is putting dollars out and not getting anything in return. The management of your Association would advise and advocate 2-10 net 30 days." And all that is needed, Mr. McCullaugh pointed out, is a little backbone. He cited the experience of the two biggest firms in the hosiery business today—the Berkshire and the Scott-Taubel-Kitzmiller—who are selling 10 days net cash—the former allots its orders instead of selling them and the latter is the biggest firm of its kind in the country. This condition Mr. McCullaugh referred to as a monument to this theory and practice.

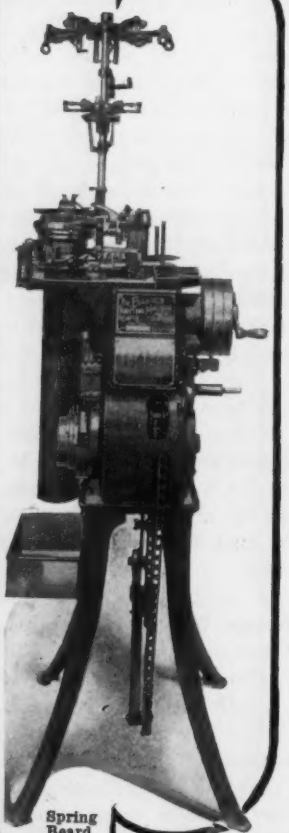
The next question discussed was that of the many various methods for measuring hosiery that now exist in the industry. These varying practices were deplored by Mr. McCullaugh as "inherited," "unnecessary and harmful" and "without any basic reason." He pointed out that after receiving a number of cancellation claims based on goods not measuring up to standard size, the Association sent an inquiry to nine mills and from these received nine different methods of measuring hosiery. He declared further that under present practices the stock of the average jobber is off from one to three inches, stating that in the stock room of Sears, Roebuck & Co., in 101 dozen pairs of stockings, he had found 56 dozen that were ½ inch beyond the size marked, 18 dozen were 1 inch below, and 6 dozen were ½ inch below. The nine methods of measuring received by the Association and mentioned by Mr. McCullaugh will be sent out in sketch form to all members, and can also be found on page 639 of the June number of COTTON. In this drawing the method marked "A" is the one advocated by the Association.

Mr. McCullaugh then took up the question of fair labeling. He recalled the famous Winsted Hosiery case, and said that following the court decision in this case the Association, working with the Department of Justice and the Federal Trade Commission, had developed a recommendation for the guidance of knitting manufacturers in labeling and advertising their goods. This consisted of the report of Arno P. Mowitz, chairman of the Association's labeling committee, which was presented and adopted at the annual convention in Philadelphia. (This report can be found in full on page 643 of the June number of COTTON.)

In connection with this report, Mr. McCullaugh urged strict observance of the recommendations made in it, and pointed out that the authorities in Washington are becoming more drastic in their prosecution of unfair labeling practices. He declared that a firm in Boston had been indicted recently because of the use of the term "pure silk lisle." He said that even such familiar terms as "gold watches," "quart utensils," "pure silk dresses" and the like are being banned by Washington as misrepresentations.

How the Association hopes to greatly aid its members by reducing the amount of grey goods stock through a decrease in the number of manufacturing sizes was next related by Mr. McCullaugh. Briefly, the plan is to manu-

The Banner Full Automatic Hosiery Machines



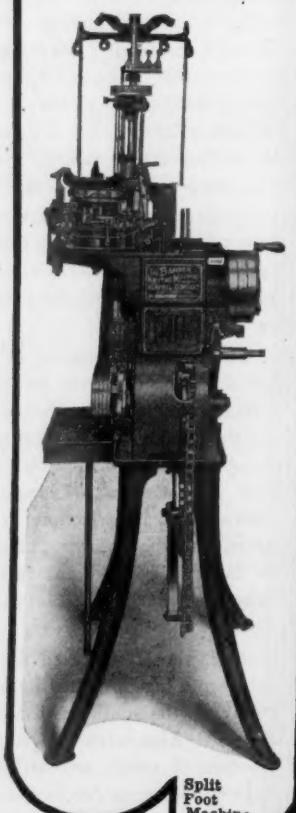
Spring Beard Needle Machine

Simplicity
Quality
Speed
Production

All Parts Accessible from the Front of Machine

We have just placed on the Market two new models—The Spring Beard Needle, built in sizes of 3" to 3 3-4" diameter, and a new model —Split Foot Machine, built in sizes of 3 1-4" and 3 1-2" diameter.

Write for descriptive catalog



Split Foot Machine

HEMPHILL COMPANY

MAIN OFFICE AND FACTORY PAWTUCKET RHODE ISLAND

TRADE MARK

SOUTHERN OFFICE and SHOW ROOMS
912 James Bldg.
CHATTANOOGA, TENN.

PHILADELPHIA OFFICE and SHOW ROOMS
208-9-10 COLONIAL TRUST BL'DG.
PHILADELPHIA, PA.

facture three white goods sizes instead of six, working on a standard basis of 8¼, 9¼ and 10¼, boarding up to the half numbers and boarding down by pulling the ears. Among the advantages of this plan—which is for ladies' seamless and men's hose—increased productivity, better balance of production, reduction in grey goods stock, elimination of break down and set up time, and the liquidation of capital released through the reduction of stock, were cited by Mr. McCullaugh. He reported tests that had been made in mills using this system, stating that at one mill, which ran as a test 1,187 pairs on the basis of the quarter standards, there were four pull-offs that could not be used

"We examined the finished stockings," declared Mr. McCullaugh, "and found that where there was a strain the stretch did not take place in the heel or the toe but in the bottom of the stocking where it wouldn't bother anyone unless we went around without our shoes and I don't think we're going to do that. Furthermore, most cotton fabric has an elastic stretch of six per cent at least so that if you do get that stretch you get it where it will not affect the wearing qualities."

At this juncture, Mr. McCullaugh declared the Association is going into the matter of standardization of yarn purchasing contracts. He said they would recommend that the standard for moisture in yarn be set at 7 to 7½ per cent. If the moisture exceeds this amount the manufacturer should be reimbursed, he declared. It is also to be recommended that a tolerance of 2½ per cent in yarn numbers be allowed, and that a tolerance of five per cent on actual turns per inch in yarn be permitted.

Discussion and questions on the points brought out by Mr. McCullaugh were then asked for, and in response, Harold Lamb, Union Manufacturing Co., Union Point, Ga., said, in connection with the labeling report just read, "We are making a 50 per cent wool-and-cotton stocking, and we ordered our labels 'merino.' We have packed up quite a number of these goods, but when I read in the paper that the government was taking drastic action, I ordered a rubber stamp and the hosiery we are now packing is marked 'merino' augmented by the words 'wool and cotton.' Will it be necessary for us to unpack the goods already in the cases and change the labels on them?"

Mr. McCullaugh replied that it would be unnecessary to do this. "I was in Washington Wednesday," he said, "and I explained to them that it would cost us thousands of dollars to change the stock, and they told me that a man would be perfectly safe if his records would show that the goods were packed prior to the court ruling." This ruling took effect on May 23, he added.

A member asked if a mill using jobbers' labels would be liable under the ruling, and the reply from Mr. McCullaugh was in the affirmative. "You are responsible," he added, "because the factory thus becomes a party to the misbranding. Send back their labels if they misrepresent the goods."

Another member suggested that an educational drive be made on the retail merchant. He declared he is making a stocking that sells at retail for $8.50—with lisle top and silk boot—and that when he labeled these in accordance with the Association's recommendations, a retail merchant sent back 15 dozen to the mill.

Mr. Lamb warned those making a combination wool and cotton product and sending it out as all-cotton that the railroads may jump on them and make it cost the mills some additional money. He reported that he is trying to get a special dispensation from his railroad.

Mr. Davis asked if on wool-and-cotton goods it was necessary to give percentages. "No," replied Mr. McCullaugh, "but if cotton is in excess of the wool, the word cotton must appear first on the label"

Chairman Davis endorsed the method of manufacturing sizes recommended by the Association. "We are trying this out at our Kingsport mill," he said, "and it will decrease the stock of grey goods at least 30 or 50 per cent."

At this time, E. A. Walker, representing the Civitan Club of Jefferson City, Tenn., was given the privilege of the floor to state that he would be glad to see any knitters interested in establishing a branch plant and desiring to secure an existing building. He stated that Jefferson City has such a building, left by a woolen mill which removed its machinery, and that the Civitan Club is desirous of locating a knitting mill there.

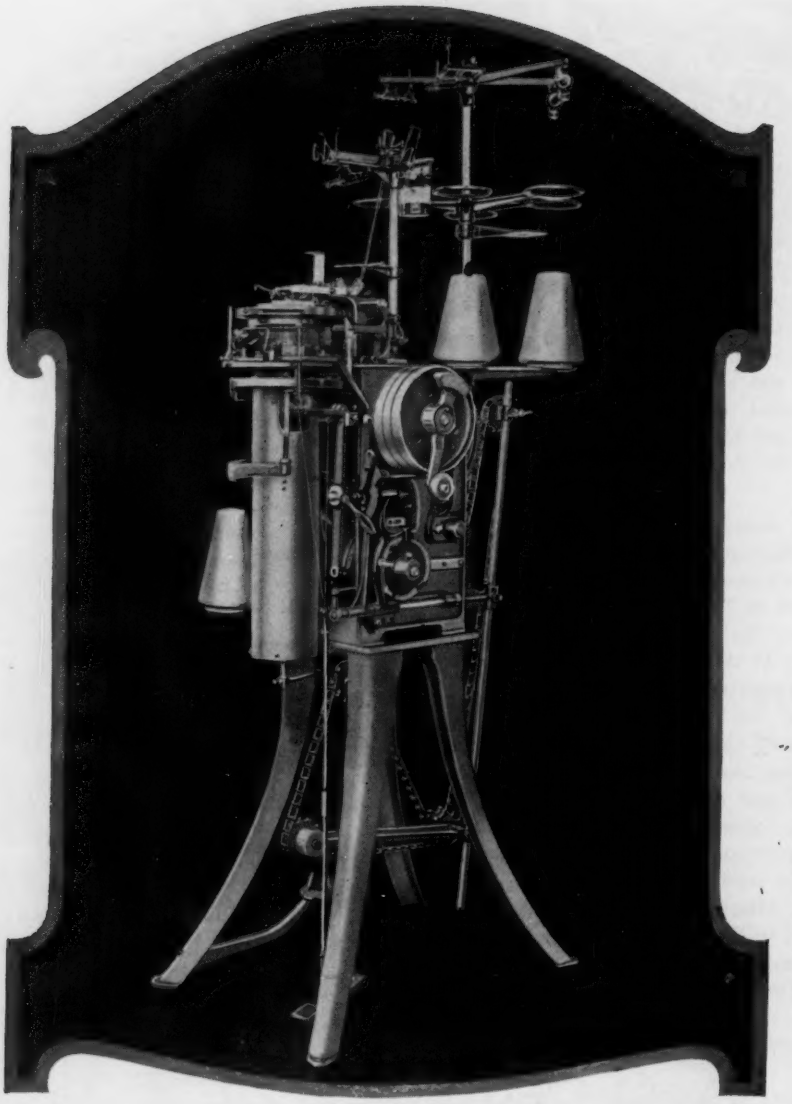
It was announced that by reason of the election of Frank L. Miller, Jr., to the directorate of the National Association, it would be necessary to name a vice-president for the southwestern division, and Harvey Wilson, of Chattanooga, was unanimously elected to fill this position succeeding Mr. Miller.

A brief talk by Harold Lamb, urging closer cooperation between the knitters, closed the session and the delegates repaired to the dining room where a splendid luncheon was served. At this luncheon a number of the associate members were called upon and each responded with a brief talk. Mr. McCullaugh called attention to the use of the term "quasi-combed" for yarns, declaring that when the marine corps requested bids for 500,000 union suits, specifying combed yarn, a mill had submitted a price exceedingly lower than a member mill, and investigation developed the fact that the yarn used by the mill with the lower bid was called "quasi-combed" and in point of fact was not combed at all.

At the luncheon also Mr. McCullaugh brought up the question of merging the Associations in the knitting industry, asking the knitters if they "desired to have the individuality of their Association submerged." The men responded with a rising vote of approval of Mr. McCullaugh's actions in remaining out of such a combination, and declared themselves vigorously opposed to such a move on the part of the National Association of Hosiery and Underwear Manufacturers.

In discussing the conditioning of yarn, H. T. Bryant, Jr., Richmond Hosiery Mills, Rossville, Ga., declared they have established a method whereby ten cones of yarn are taken from each case coming into the mill, reeled and tested for breaking strength, then reeled on the blackboard tester and through the umbrella tester and then tested for twist, and then put in the oven to test for humidity. Their idea, he said, is to establish a method to catch the bad yarn that comes into the mill. He indicated that the same thing will apply to silk.

COTTON is full of ideas that it has taken overseers and superintendents years of study, hard knocks and experience to find out. You can acquire them in a few minutes. What an opportunity! Are you taking advantage of them?



WILDMAN
THE WORLD'S STANDARD

Wildman Spring Needle Knitter

A generation of striving for mechanical perfection is embodied in the Wildman Spring Needle Knitter.

We aimed not merely to produce a good machine, but one that should be a factor in production so that it would help to develop the hosiery industry—anticipate and meet the ever growing demand for the finer kind of silken hose. We are now able to sell Wildman Spring Needle Knitters in all foreign countries.

On request we will send the "Wildman Spring Needle Knitter Machine Instruction Booklet," giving detailed information and description of every important part of the machine.

TRADE MFG MARK

WILDMAN MFG. CO.
NORRISTOWN, PA.

Latch Needle Circular Ribbers

BY G. R. MERRILL.

The pattern mechanism is designed to control the pattern of the fabric or article being made. Small ribbers are used very extensively for making half hose cuffs, and legs for children's hose. These are made in a continuous string with one or more welts at the top and a loose course near the bottom of each article.

The welt, used for garments of this sort, is a heavy or thick place, encircling the tube, designed to give the upper end of it some finish. The possible ways of making a welt are many. It may consist of merely a tuck stitch on the dial needles at that point. It may be obtained by ceasing to knit on the dial needles. It may be made by a combination of both these actions. In any case, the action of the dial needle, whether tucking or idle, does not continue unchanged for more than three or four consecutive courses, because to do so would cause trouble, either from loading the dial needles or knitting on the cylinder needles without sufficient tension. Sometimes a large welt is made of several small ones very close together.

The loose course, which is used for transferring the article to the machine making the foot, is a course of extra long loops. These loops make a perceptible line around the article which can be easily followed when placing the loops on the pins or quills of the transfer ring. It is customary to have only one course.

The pattern mechanism for half hose cuffs and legs of children's hose controls:

1. The length of finished cuff or leg,
2. The number of welts,
3. The size of the welts,
4. The spacing of the welts,
5. The loose course,
6. The number of transferring courses or lengths of fabric wasted between the end of one article and the beginning of the next.

There are, of course, various types of mechanical devices used as pattern mechanisms, but the one discussed here is that used on the machine treated in the previous discussions of cams, yarn guides, and take-up. It has control over the positions of certain of the cams at various times and so gives changes in stitch and it, in turn, is controlled by the cloth to some extent, thus giving a repeat of pattern in a certain length of cloth.

This pattern mechanism consists of a gear, two ratchet gears and wheel to which small plates are attached. The accompanying diagrams show the ratchet and pattern wheels. These are all located on a short shaft, called the pattern shaft, situated just below and a little to the left of the cylinder. A front elevation of this shaft is shown in the accompanying diagram, Fig. 1.

One ratchet wheel is located on the outside end of the pattern shaft and is loose on it. The gear previously mentioned is held against this wheel by means of a frictional device. Thus, these two may be turned as a unit or in-

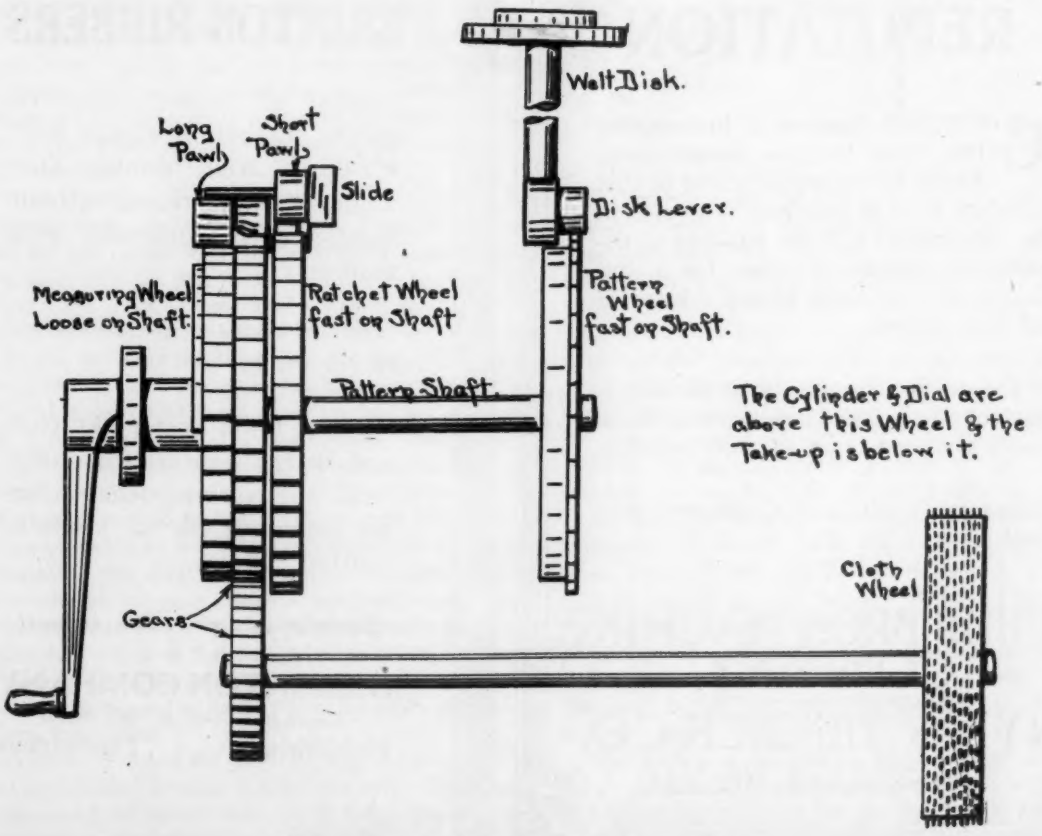
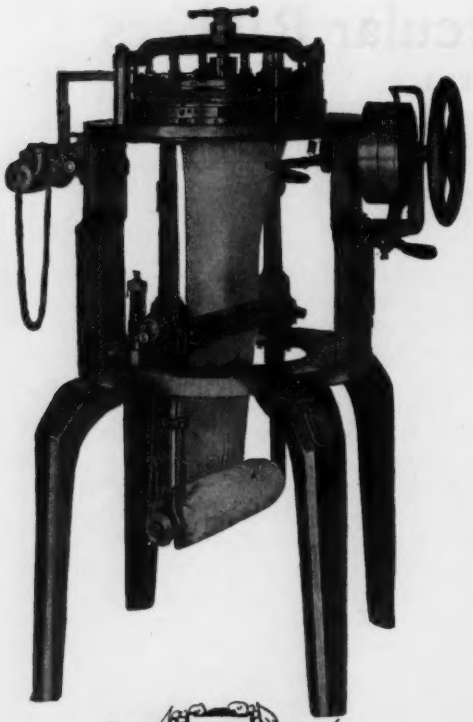


FIG. 1. PATTERN MECHANISM FROM THE FRONT.



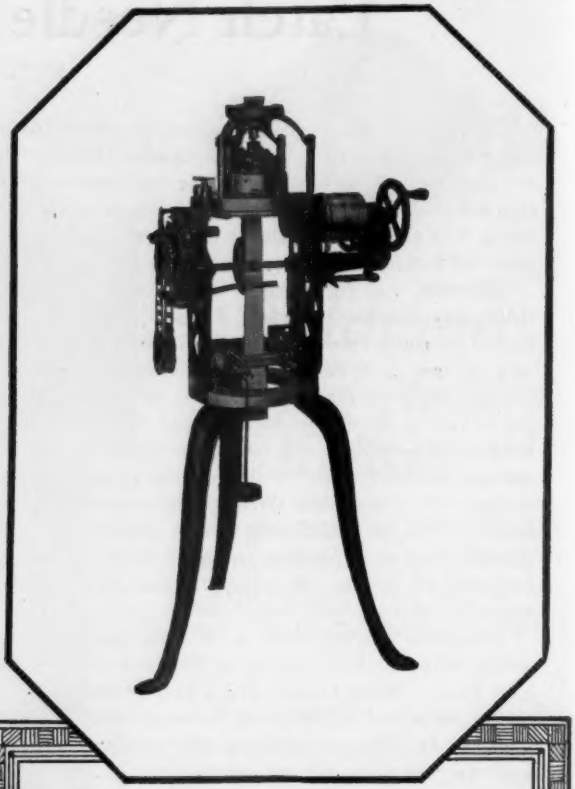
REPUTATION

COUNTS in business as in everyday life. Our business career spans nearly half a century, and in that time we have established a reputation for fair-dealing and the building of dependable, durable machines for manufacturers of circular ribbed fabrics of all descriptions.

We claim for our machines simplicity, correct principles of construction, durability and excellence of workmanship.

Reputation—with half a century's time back of it.

TRUMP BROS. MACHINE COMPANY
SUCCESSORS TO
NYE & TREDICK CO.
BEECH AND ANCHORAGE STS.
WILMINGTON, DEL. U.S.A.



BRINTON RIBBERS

possess all modern improvements, including selvage welt, French welt, double knee dogless and striping attachments, with automatic stop motions.

Built in all sizes, for all classes of rib work.

We also build hosiery knitters and Body machines for underwear and various other circular machines for all kinds of knitted articles.

Samples and prices on request.

H. BRINTON COMPANY
Kensington Ave. & "M" Street
Philadelphia Pennsylvania

dividually. Next to these, comes the other ratchet wheel which is fast on the shaft. On the inner end of the pattern shaft, the wheel with the plates is made fast. The outer ratchet wheel is called the measuring wheel, the second ratchet wheel is called the ratchet wheel and the wheel is called the pattern wheel.

The two ratchets are driven by pawls fasterned to a slide just above them. The measuring wheel is turned by what is called the "long pawl" and the ratchet wheel is turned by the "short pawl." The slide is moved to and fro by means of a lever. One end of this lever carries a roll fitting into an eccentric groove on the under side of the cylinder cam ring, the other presses against the slide and between these two the lever is pivoted on a stud fastened to the machine frame. So for each turn of the cams the slide completes one cycle and causes the pawls to move the respective wheels one tooth each.

Each of these wheels has thirty-six teeth and so after thirty-six courses, they come again to their starting position. But, it is a rare instance when thirty-six courses will be enough to make the desired article, for even a half-hose cuff is almost certain to require one hundred courses, if not more.

In order to have more than these thirty-six courses, in one repeat of the pattern, a multiplying device has been applied to hold the pawl from turning the wheels. This is accomplished by fastening to the measuring wheel a small plate, which is a segment of a circle, slightly greater in diameter than the outside circle of the measuring wheel. This holds the long pawl out of contact. The short pawl might still move its wheel except that a pin projecting from it over the long pawl tends to hold it up. This alone is not sufficient, however, for this pin does not hold the short pawl so high but what it engages with the teeth of the ratchet wheel when the long pawl is resting on the multiplying plate. The ratchet wheel has some specially deep teeth in two positions, which now come into play, for when held as just described, the short pawl cannot engage with these deep teeth.

Thus, when the multiplying plate is fastened to the measuring wheel, the latter is no longer driven by the long pawl, but the ratchet wheel continues to be turned by the short pawl until the deep teeth come under it. Then, the ratchet wheel turns no more until the short pawl is allowed to drop low enough to engage with these deep-cut teeth.

So far, provision has been made for stopping the pattern mechanism and the next step is to provide another means of moving it while the pawls are held out of action. This is done by means of a "cloth wheel," beside which the cloth passes, connected by a shaft and gear to that gear and held against the measuring wheel by a friction device. The wheel is covered by a clothing, set with sharp wires, about a quarter of an inch long and is in this case five inches in diameter. The cloth running against this wheel turns it and so through the gears turns the measuring wheel. Normally, the pawl moves this wheel much faster than this arrangement and so at that time it has no effect, but when the pawl is out of action, this device turns the measuring wheel very slowly and so finally allows the pawls once more to come into action.

As shown in one of the diagrams, Fig. 2, the measuring wheel is equipped to make a half hose cuff. The longer section, where the pawl is held out of action, provides for making the proper length between the welts at the top and the loose course at the bottom of the cuff. The two notches provide for the insertion of the loose course and the shorter section provides for the length of material between the loose course at the end of one cuff and the welts at the beginning of the next, which is known as transfer courses or waste.

If starting a cuff, the long pawl will just have dropped over the extreme right end of the multiplying plate and the short pawl will be engaging with the deepest tooth of the right hand deep cut set. Then, each pawl will move its respective wheel one tooth for each course for thirty courses and the long pawl will be lifted by the multiplying plate. The short pawl will continue to move the ratchet wheel for three more courses and will then come to the deep teeth. During the first ten courses, the machine will make two welts and then it will knit an ordinary ribbed

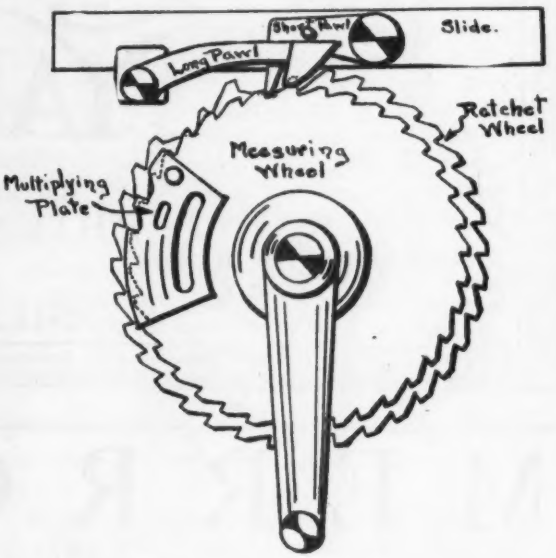


FIG. 2. THE MEASURING AND RATCHET WHEELS.

tube until and during the stay of the long pawl on the first (longer) section of the multiplying plate. When the long pawl drops into the first notch of the multiplying plate, the short pawl engages the first deep tooth and then moves the ratchet wheel to the next deep tooth. It stops here because the long pawl has dropped into the second notch and then moved on to the short multiplying section of the plate during this time. This action makes the loose course and then the following transferring courses, setting the machine to start the next cuff. The length of material made during the multiplying operation depends upon the length of the segment holding the long pawl out of action.

So far, this discussion has been concentrated on the measuring and ratchet wheels with no consideration of the actual means of producing the pattern desired. The means used to actually operate the cams giving the pattern are the pattern wheel, the disk lever and the welt disk. The plates fastened to the pattern wheel are of different heights and they lift the disk lever by means of a small roll, and this lever in turn lifts the welt disk which strikes arms controlling the knitting cams.

The pattern wheel with no plate attached allows the welt to drop to its lowest position, where the larger diameter strikes the arm which controls the cylinder cams, causing the cylinder needles to draw an extra long loop, which

ABERFOYLE MANUFACTURING COMPANY

MERCERIZED YARNS

MAIN OFFICE
EMPIRE BUILDING
PHILADELPHIA

ADAMS-FRANKLIN BUILDING
CHICAGO

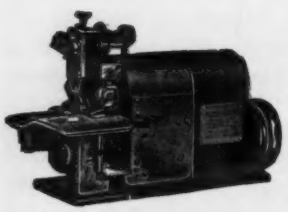
MILLS
CHESTER, PA.

WESTAWAY BUILDING
HAMILTON, CANADA

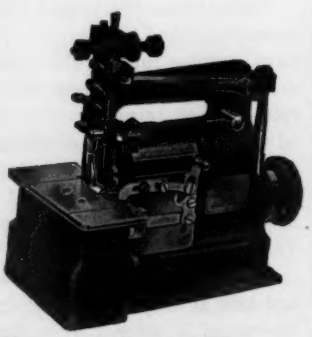
MERROWING

ESTABLISHED 1838

Makers of



The Merrow High Speed Overseaming Overedging and Shell Stitch Machines.



MERROWISE FOR EFFICIENCY IT MEANS

MAXIMUM PRODUCTION
MINIMUM EXPENSE
UNEXCELLED QUALITY OF WORK

THE MERROW MACHINE COMPANY

16 LAUREL ST., HARTFORD, CONN., U. S. A.

is used for a loose course. This may be called position 1.

With the ordinary plate fastened to the pattern wheel, the welt disk is lifted so that the larger diameter strikes the arm releasing the cylinder cams, causing them to draw the ordinary length of loop. At the same time, the larger diameter of the welt disk strikes the long arm controlling the dial cams and causes them to knit. This may be called plate 2 giving position 2.

A third position of the welt disk is obtained by having a plate slightly higher than the ordinary plates. When at this level, the smaller diameter of the welt disk strikes the upper arm controlling the dial cams and causes the welt cam to move about half way in, thus producing (as shown in the previous discussion of ribber cams) a tuck stitch on the dial needles. This may be called plate 3 giving position 3.

Another position, even a little higher than the third, is obtained by a slightly higher plate, and causes the larger diameter of the welt disk to strike the upper arm controll-

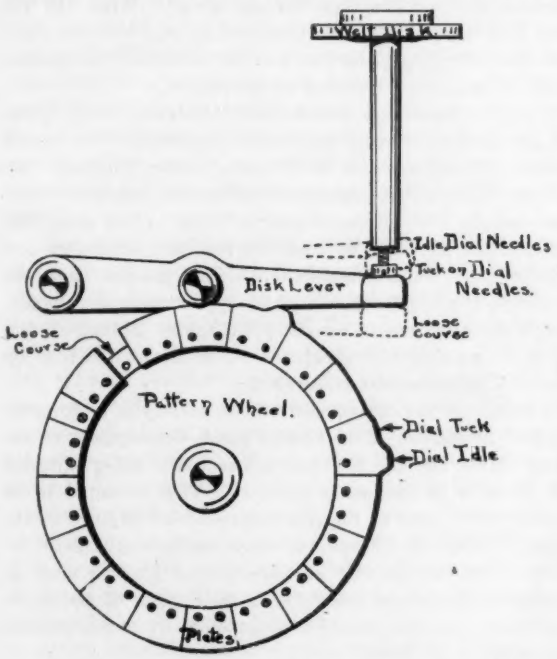


FIG. 3. PATTERN WHEEL.

ing the dial cams. This moves the welt cam in as far as it will go and causes the dial needles to cease knitting. This may be called plate 4 giving position 4.

It is quite common practice, when making a welt, to first make a tuck stitch for one course on the dial needles, and then to make one, two or three courses on the cylinder needles while the dial needles are idle. This would be accomplished by having the pattern wheel have one plate 3 and one, two or three plates 4, where each plate controls the pattern for one course. The pattern wheel, as shown in Fig. 3, is built to go with the pattern ratchet and has thirty-six holes for attaching plates, so that for each tooth on the pattern ratchet it is possible to have pattern control through the pattern wheel. The majority of the plates shown cover two holes and so control two courses. This is because it is mechanically a better arrangement than having a plate held by only one screw.

Notice that there is one hole having no plate attached. This means that for one course, the machine makes a loose course. Then, there are two double plates causing a rib stitch of the ordinary fabric for four courses. Next, there is a double plate which has two levels, the first is that previously called plate 3 and the second is plate 4. Although, it is but one plate, it controls the pattern for two courses and the first course would have the dial needles tucking and the second course would have them idle. This would be the first welt. Following this would come four more courses of ordinary fabric and then another welt made in two courses, as was the first.

The measuring wheel and pattern ratchet are so arranged that, just before the disk lever roll drops into the empty space for the loose course, the multiplying plate has come under the long pawl and the first set of deep cut teeth have come under the short pawl. Thus, the particular length desired between the welts and the loose course is obtained. Then, the measuring wheel multiplying plate notches allow the pawls to engage and when this happens the pattern ratchet moves three teeth before stopping. This also moves the pattern wheel three narrow plates, or into the loose course position and two courses beyond. Here the other section of the multiplying plate stops the pattern mechanism long enough to make the required length of transfere courses or waste, after which the operations just described are repeated.

This discussion illustrates the construction of a half hose cuff and the arrangement of the adjustable parts of the pattern mechanism to obtain it. Other arrangements are often made for building the welts, some cuffs having only one while others have three. Not always are these welts built in two courses, sometimes three or four courses are used to build them. For instance, a four course welt may be tucking on the dial needles for one course and keeping them idle three courses.

The legs for children's hose are made similarly to half hose except for the length. The multiplying plate would be considerably longer to make a longer length between the welts and the loose course. The welts and the loose course need be no different than those used for half hose and the number of transferring courses may remain the same.

I. B. Williams and Sons, Dover, N. H., manufacturers of leather belting, have announced the establishment of a new department of their business for the manufacture of mill strappings of all kinds. They have equipped the new department with special machinery for the manufacture of every type of strapping or leather pieces of special shapes required by manufacturers in any line. T. L. Chapman, who has for many years been the New England manager for the Deford Company, also conducting their mill strapping department, has become connected with I. B. Williams and Sons and will have entire charge of the new department. Mr. Chapman has a very extensive knowledge of the strapping business as well as of curried leather of all kinds and the new department, under his management, is expected to prove of great service to manufacturers needing strapping or special leathers.

National Aniline & Chemical Company has issued color card on National Sulfur Yellow GR, a sulphur dye recommended as a self-shade and in combinations for ginghams, khakis for overalls, military cloths, etc.

Progress of the Knitting Industry

BY WILLIAM DAVIS, M.A.

A British Angle on the Situation Brought Out by the Nottingham Machinery Exhibit.

There are few branches of the textile industry which have shown such remarkable development as that of knitting and this is a progress which is certain to be continued for some considerable time to come.

In its inception, knitting was for long regarded as one of the elementary industries because the first attempts were chiefly in the direction of the plain stitch and the producing of this by machine. It cannot be so regarded today, because the stitch in its plain form while still used for large sections of the trade, is sufficiently altered and modified in many ways to impart an air of novelty to the goods which the markets are not slow to appreciate. So many branches of the trade require to produce the goods ready for wear and the best way of doing this is the constant concern of the knitting machine builder. Probably no branch of the textile industry has been better served by its machine builders. In some branches of weaving one is forced to the conclusion that a sort of finality has been reached in many of our weaving mechanisms, but in the knitting industry there is a never ending striving after new machine attachments which will produce some certain effect in the goods.

In this race for supremacy the American knitting machine builders of automatic hose machines have come out very strong and their standard types of web producing machines for plain and ribbed products rank high in most knitting communities. When the American machine builders took the lead in regard to the fine gauge fabrics it opened up to them a wide field for enterprise. The American market has always taken large quantities of fine gauge materials and this is a vogue which shows a decided tendency to expand into other countries. Along with the fine gauge of machine, the American machine builder has largely favored the moveable needle cylinder which has made a much higher production possible than was the case with the stationary cylinder and moving cam boxes.

There is only one thing which retards the expansion of the use of the bearded needle circular machine as used for the finest gauges and that is the high price at which this machine is sold in countries to which it is exported. This type of frame was largely built by Germans in pre-war days but they do not show emphatic signs of regaining their pre-war importance in this respect. At present their machine builders cannot export machines as they appear to be so full up with orders for domestic markets or nearby countries.

The Wildman latch needle web machine for fine gauge high class texture will have a fine run in foreign European countries as soon as the price can be brought within more reasonable limits as it is this which restricts its more general use in the industry.

Great interest is being taken at the present time in the arrival in Great Britain of the Scott and Williams H.H. machine which is to be shown in the Institute with which the writer is connected at the Exhibition of Hosiery Machinery to be held in Nottingham next month.

Manufacturers are anxiously waiting the advent of a machine which will rid them of the great trouble of running on the rib tops to hosiery as a separate operation as is done so extensively at present. The rib top is knitted on a machine quite separate from the hose machine proper and in this process many things happen to cause blemishes in the goods. The running on is usually done by hand by young help and although the process looks simple, it is really an expert operation where skill can only be acquired after a long period of practice. The fact that the ribs are made on a separate machine under different conditions of stitch tension usually causes a difference in the elastic properties of the fabric, particularly at the join, because it generally happens that there is a certain tightness where the transferring has been brought about. When the rib top and the plain leg are produced on one and the same machine, the join is perfect and no difference in appearance or handle can be noted at the join.

In this connection considerable attention is being given to the machine recently put on the market by Wm. Spiers the well known machine builder of Leicester, England. He is the maker of the automatic ribbed hose machine which has recently been improved and perfected so that plain legs and ribbed tops can be made on the same article on one machine, by transferring double-headed needles from the lower to the upper cylinder, and by reversing the needles when the stitch has to become plain again. Manufacturers here are waiting with great interest results of the tests on the two machines just referred to.

There are indications that ribbed hosiery is to form an important feature of the knitted goods development of the near future and the last named machine is being exported to America in increasing numbers. This is stated to be one of the results of the American soldiers' sojourn in the fighting areas in Europe for when on furlough, those interested in the knitting industry visited English machine builders and became interested in their types of which the automatic rib hose machine is undoubtedly a conspicuous example.

Apart from the introduction of the machine, an increase in favor in regard to ribbed goods is making itself manifest, apparently as a permanent feature of the trade. The ribbed stitch is a welcome variation from the plain knitted loop, and hosiery made in this stitch has a character all its own and imparts an air of distinction to the wearer. Very often these are made in quite coarse gauges and in blended color mixtures so much in vogue for sports' wear. While the largest quantities of these goods occur in coarse or medium gauges, increasing numbers are being made in the finer gauges in silk materials so that they can be used for summer wear. The ribbed hosiery worn by the bride at the recent Royal wedding gave a distinct fillup to this branch of the trade and it is a wave of fashion which has made itself felt quite distinctly even in democratic America. Ribbed goods give a fuller texture than plain and the ridges impart a character to the texture which belongs only to ribbed goods; the plain texture tends to pall on the wearer and the ribbed articles afford a welcome relief and change. The higher classes of such goods

are manufactured in 40 gauge flat machines of the Cotton's Patent type.

There is a distinct tendency on the part of the public who can afford to pay the enhanced price to favor goods made on the full fashioned principle, particularly in the higher grades of footwear. Moreover, the public is showing a decided insistence on the fashioned article and are becoming keener judges of the different classes of the knitted product. They instinctively seek the seam up the back of the hose and examine the method on which the foot is built up. Makers of circular automatic hose machines have used all their ingenuity to imitate the fashioning marks down the back of a hose but even with this addition the public are becoming more discriminating. The great disadvantage of the seamless hose is that the diminution in width as you proceed down the leg is only obtained by alteration of the size of the loop, this being shortened as the ankle is approached. This shape is further accentuated by broadening out and while it often proves quite satisfactory for a spare limb, it does not suit a more shapely calf where the effect is to have the ankle part bedraggled and untidy whilst the fabric at the calf is stretched out and attenuated in a rather unseemly fashion. In the full-fashioned article the narrowing along the leg is performed by actual reduction in the number of loops forming the width and the texture remains the same throughout. Also in making the heel and toe, greater scope is given to the foot.

One of the most remarkable developments taking place at the present time in the knitting industry the world over is that of the fancy trade as performed on the flat knitting machine which had its original form in the Lamb frame, well known in the American knitting world. Makers of this type of machine are literally being "pulled" out of the place to deliver these machines. They are largely built in Switzerland and the adjoining area but several firms in Germany and England also specialize in this class of mechanism. These machines are simply unobtainable at the moment on account of the enormous boom. The reason is more deeply rooted than would appear at first sight, for it is an indication of the way in which the garments made on the knitting machine are usurping the place so long held exclusively by the woven product.

If we take the average store display of clothing, we may find about 25 per cent of the display of outer garments are produced on the flat knitting machine. The knitted robe trade is largely done on web worked in a fine gauge in silk or other lustrous material which is afterwards cut to the shape and tastefully trimmed and finished according as the latest fashion dictates. The garments made on the flat knitting machine are usually fashioned in their parts on the machine and a higher price has to be charged to meet the extra cost of producing the garment.

It is curious that so little headway has been made in the application of power to machinery of this class. Machines are made by the leading machinists with several divisions where each division works a separate garment entirely automatically. The machines use the latch needle and next to the difficulty in narrowing or widening by means of this needle, we have the great trouble caused when presses-off occur in the machine. The fabric can very rarely be picked on again because of the fancy nature of the stitch and such pressed-off pieces of fabric have to be relegated to the waste bag. As a result we find that the great bulk of such machines are worked by hand where the worker can exercise instant control over the machine and call a halt before the fabric is thrown from the needles. We, therefore, have cases where power machines have been discarded and hand-driven machines substituted. This applies with particular force when the Jacquard attachment is made to the flat knitter which ensures a much wider field of pattern selection than the plain machine.

There can be little doubt that the average manufacturer in other branches of the trade has a very limited idea of the capacity of this machine to make fancy stitches. If the ordinary cam box be employed with the addition of an extra thread carrier, a wide assortment of very fine patterns can be made. Not the least important of these are the stitches which have the appearance of being produced on a much more complicated machine. The Jacquared machine described in some detail in COTTON some time ago is now being largely used for this trade on account of the designs it can produce where fabric of a variable surface is forthcoming by using one needle bed only for a few courses and allowing the opposite bed to pile up a set of stitches plain.

The pearl machine, which is constructed absolutely flat, with two needle beds in the same plane so that the double headed needle may be quickly drawn out of one bed into another to make the pearl stitch, is also in demand. It is found that the pearl stitch machine is admirably suited for the rapidly growing trade in children's garments where the pieces are small and short and when made in a coarse stitch can be produced with remarkable facility and considerable output. When the gauge is coarse the balance weighs still more heavily to the goods being made by hand on the machine, also if frequent changes have to be made in the style or pattern, these can best be brought about on a machine of this description.

In all these developments we have dealt with the machine only, but the manufacturer has also to consider the personal element and study how these new machines have to be manned. In a firm where the work is at persent done on automatics, where operatives have for the most part only to stand and watch the machines doing the work it is extremely difficult to obtain the right kind of workers who will set themselves to master the hand machine. It is much more trouble, a considerable amount of counting has to be done and the swinging of the handle all day long imposes a strain on the operator until he or she becomes inured to it. Designers have also to be trained and it is difficult to find such workers amongst those who have for the most of the time been employed in white or solid colored goods. In many cases the master or his son or someone intimately connected with the firm have to take on this work themselves, and many find it fascinating work if they show aptitude for it. The province of the flat knitting machine is chiefly that of the coarser gauges of knitted fabrics required for outerwear.

Winding is one of the most elementary processes connected with the knitting industry but some of the most active spirits are at present engaged in perfecting the processes as regards the particular requirements of the knitting industry. One type which is largely employed for winding yarn to be used in web producing machines is known as the "Jumbo" bobbin which is long and carries

a considerable weight of yarn on it. In one machine which had come to be regarded as a standard type, the downward movement of the traverse of the thread is distinctly faster than the upward one on account of the impetus given by gravity to the bobbin platform, which, with its weight, accentuates the downward movement distinctly. In addition the machine is rather noisy in its action which is a disadvantage in these days when such efforts are being made to eliminate unnecessary noises from the factory.

In recent makes brought out by several firms, the shaft on which the bobbin platform rests is balanced in that the machine is divided into several sections, each section having a different phase so that the downward moving platform in one part balances a rising part at another and the speed remains constant throughout. Another improvement which makes for reduction of noise in working the machine is the driving of the bobbin spindle by means of a band after the manner of a spinning machine. These features mean an all round alteration in the type of machine employed for winding knitting yarns where a large bobbin holding a considerable weight of yarn is desired to be produced and they are likely to find increasing favor when new machines are installed.

The knitting industry has very special requirements in this regard and this is particularly the case with refernce to the working of artificial silk yarns. The most successful method at the present time of winding those difficult yarns is to have a two operation process, 1st to wind the material from hank on to bobbins and, 2nd, to wind again on to the small size of jumbo bobbin so generally used for the knitting machine. It is a replica of the larger bobbin but has a smaller circumference of wind so that in drawing the material off it does not ravel or come off too freely.

Machines at present employed for this work are made by the Universal Winding Co., but the trade are awaiting with much interest the advent of a satisfactory method of winding artificial silk direct from the hank to the bobbin. The knitting industry is finding increasing use for artificial silk yarns of all grades of fineness and this fiber has become firmly established as a factor in the making of knitted goods and finds a wider scope each year. In the present season, its most successful uses are based on the making of bands of artificial silk alternating with broad bands of woolen or other material either white or in color. It is also being increasingly used in making ladies' dresses for Summer wear.

European mechanical developments in finishing knitted products occur very considerably under the influence of the machinery imported from the U. S. A., this being particularly the case in regard to such processes as pressing, scouring, fulling, and calendering. The Braithwaite presses are being largely introduced into hosiery factories for giving goods their final press and finish before sending them out to the customer. This must not be confused with the pressing the material undergoes when it has been scoured and finished, but refers to the final press given to it when it has been carved into a garment and is wrinkled or creased by having passed through many different hands. In finishing and pressing such articles as hose, a controversy is being waged as to whether it is better to supply the heat from the inside as on the Paramount forms or from the outside as is done in many types of pressing machines. This depends somewhat on the type of finish desired. When heat is supplied to damp goods from the inside, it is claimed by some that it gives them a much loftier handle than when the heat is applied externally when the moisture is driven inside the article and renders it dull "sad" in aspect.

Similarly in developments which are taking place in pressing and calendering machines, we have the clear glazed metal rollers which by great pressure on the goods as they pass between, impart considerable gloss to the fabric. Customers find that in many grades of goods this gloss proves fleeting and an important class of buyer is showing a preference for goods which are duller in appearance combined with a fuller handle which remains more permanently associated with the goods.

British machine builders have been very successful in getting out various types of brushing machines which have been largely adopted in the trade during the past few years and which has given a much wider scope to otherwise plain productions. Very successful results are obtained by raising or brushing loosely spun cotton yarns and so much skill has been achieved in this department that undoubtedly many buyers take those goods under the first impression that they are manufactured from wool. During the war much search was made for German methods of imparting to those brushed goods a special softness due to finishing them with certain oils in the concluding finishing operations and particulars of these chemical finishes are now coming to hand which further enhance the feel of these products.

In regard to pressing machinery it should be pointed out that a great demand is being felt for machines where the steel rollers are being replaced by an endless band of thick felt which is made to revolve round the rollers and when the goods are pressed between this felt it imparts a more subdued appearance to the goods than is the case with time bare rollers. The introduction of the felt has also made it possible to have a greater limit of pressure exerted on the goods and this varying quality of finish is one of the strong features of the operation.

In regard to the fancy hose trade, machine builders are vying with each other as to who shall bring out the most efficient appliances for producing hosiery in horizontal stripes, in vertical stripes and in a combination of these two varieties to form the check. Some very interesting attachments to the automatic hose machine are at present being perfected which will considerably extend the use of the scope of this class of design which at present is often restricted to straight lines and zig-zags. In this respect special attention is being given to the trade in children's socks in both those styles of patterns.

In regard to sewing machines one notable development is the machine for making button holes. The Singer Sewing Machine Co., Ltd., are bringing out their new button hole machines which greatly increases the production possible on their present machine. A great fault in multitudes of machine-made button holes is the stiffness and rigidity of the holes which are difficult for the wearer to manipulate. The new machines stretch the holes as they are being made and thus insures a greater yield. Owing to this defect of stiff buttonholes, many high class firms had to have their holes made by hand, a slow and laborious job. Of sewing mechanisms, the kinds which adapt themselves for making

rows of fancy edging on cut garments are very much in demand, this work is done by cutting garments out of the knitted web and the raw edges are seamed together, or it is often better to seam it and at the same time ornament the garment with a row of fancy lace-like stitching which greatly enhances its appearance. The Merrow machines are being extensively adopted for this purpose of stitch ornamentation.

The Knit Goods Market

The first half of the year in the knit goods trades closed about as satisfactorily as it began, but this is not saying a great deal. By the end of June there was some improvement in the operations of jobbers in the primary market, with no abatement in their rebelliousness toward prices. Advances were paid on certain lines because the lines were not in as large supply as buyers thought or affected to believe. Comparatively few manufacturers, however, were able to maintain sales at their higher prices. As instancing the effect of increases, a manufacturers' price of $12 a dozen on a woman's smock coat was increased 10 per cent. The instant jobbers added the increase to their price to retailers the latter dropped out of the market. They simply would not pay more than the figure named earlier in the season.

A favorite line of light weight underwear was advanced less than 10 per cent and jobbers sought to pass the increase along to the retailers—a matter of two cents per garment maximum. It couldn't be done. Dealers affected to be not able to comprehend why goods should cost them more now than six months ago. It is not inappropriate to refresh the recollection of some of these obstreperous distributors.

A little more than two years ago a mill line of fancy silk hosiery for ladies was being delivered at $30 a dozen, the price established when silk was costing manufacturers some dollars a pound less. The mill delivered every dozen, at the order price, throughout the period of continual rise. Jobbers sold those stockings to retailers at $48 a dozen. These same distributors this year have not been willing to concede to mills justification for advances for covering only in part the higher cost of silk and mercerized yarn. Formerly they took advantage of the rise for themselves; now they insist recent prices shall not be moved upward, no matter how much production cost had been increased.

The attitude of the jobbers is costing them the loss of considerable business which is going directly through catalog houses and chain stores and to the department stores. More mills than ever before are selling direct to the retail trade and the purchases of the consumer from the catalog houses are increasing, according to the published reports of such establishments.

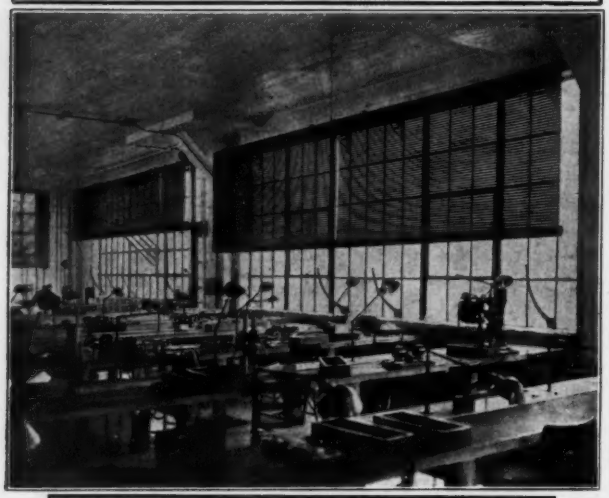
Some time ago jobbers thought they had built a wall around the full fashioned silk hosiery factory of Henry Lehmuth Company, Philadelphia. They refused to buy the mill's product at what the mill was asking for it. Perhaps the price was held at an unduly high figure, but at any rate, the Lehmuth company announced that it would no longer sell to jobbers, having arranged to distribute through retailers direct, and now the line is being handled by Rubens & Meyers, jobbers, in New York. The Lehmuth stocking is not being jobbed by the firm; it goes direct from mill to retailer, with the lines handled by Rubens & Meyer. This arrangement made it unnecessary for the mill to build up a selling organization.

The time and money required in the organizing of a selling force are the chief deterrent to the working out of plans of manufacturers for selling direct. It is not easy to find unattached a forceful sales manager who knows hosiery and possesses the selling know how, and a selling crew is not so easy to pick up that it can be assembled in a month or two. The strong ones prefer established lines; the weak are a part of a costly experiment. Therefore the plan of the Lehmuth mill is one that offers a solution of the problem confronting mills desiring to eliminate the jobber because the jobber has been eliminating certain mills having a pride in adhering to their terms and to prices representative of value. Few of the present retailer mills can keep their trade supplied and are drawing heavily from other manufacturers.

Some of the retailer mills are increasing their production, this being true especially of those manufacturing full fashioned silk hosiery. Both the McCallum Hosiery Co., Northampton, Mass., and the Gotham Silk Hosiery Company, New York, are building larger branch plants in Philadelphia which, when completed, will house an increase in the aggregate of more than 150 knitting machines. The McCallum is one mill having no competition in 51 gauge hosiery, and will install additional machines for knitting that gauge. The company sells on terms of 1/10/60 net, in contrast with 2/10/60 extra, which is being demanded by jobbers. Manufacturers reason that if they must extend such terms they might as well extend them to retailers; that if the jobber is not willing to carry goods for his customer it is entirely his affair. If he cannot finance his business, it is held, he ceases to be able to function as a distributor.

A manufacturer who admits he is selling on terms 2/10/60 extra says he adds the cost of doing business in that way to the price of the goods. He is due for a jolt. Having won one concession, that of terms, the jobbers will next set up a fight for prices as low as those named by mills selling 30 days net. Jobbers will not pay more unless they get more from retailers, and the cry has been that the retailer is the ebony hue individual in the wood reserves. Almost anyone can sell goods on buyers' terms in any sort of market. Sellers who can sell on the terms of their organization have something more than stamina—they have the goods that speak for themselves. "I would rather produce something so good that buyers would be glad to buy on my terms than offer something which they could get anywhere and which I might have to let go on their terms," said a manufacturer specializing in women's ribbed mercerized hosiery. "We have no difficulty in keeping our mill going full time, and one department overtime, and our terms are 1/10/30 net, no extra, but interest added at six per cent per annum for every day an invoice remains unpaid after 30 days. There are no exceptions to this rule, and buyers who cannot operate that way are not asked to give us their business. We would respect them no less if they bought as good or better hosiery on more advantageous terms."

THE PARKER PEN COMPANY have standardized on RA-TOX shades throughout their entire plant. Working with small shiny metal parts which demand accuracy in their manufacture, requires a perfect working light. RA-TOX Shades contribute daily to the efficiency of the Parker Pen working organization.



RA-TOX

Wood Fabric

VENTILATING WINDOW SHADES

filter the heat and glare from the rays of the sun but still allow

30 to 40%

More Light and Air

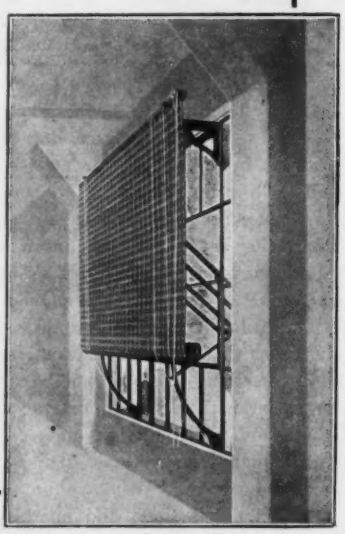
to enter the work-rooms they are shading than any other type of shade. RA-TOX Shades are good to look at. They are economical; they are indestructible; constructed of beautifully and permanently stained wood strips woven parallel with hard twist seine twine, they will with average care give satisfactory service for 25 years or longer.

Steel Sash Center Swing Ventilators and RA-TOX

Guided around the center swing ventilator by means of especially designed fixtures, RA-TOX Shades are brought back flush against the factory wall at the base of the sash, out of the way of workers and machinery.

Steel Sash Installations

By a patented process RA-TOX fixtures are secured directly to the ribs of the steel sash; no expensive boring and drilling of concrete.

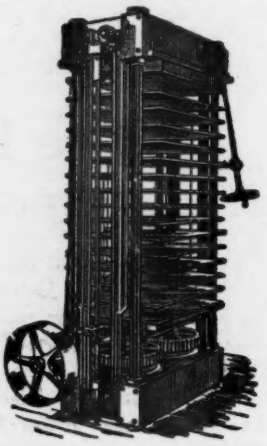


What are your window specifications? Write for price quotations and further descriptive literature.

HOUGH SHADE CORPORATION

Industrial Shade Division

300 Mills Street Janesville, Wis.



RELIANCE

Hot Plate Screw Press

FOR

Hosiery and Underwear

Write for Catalog and Prices

Reliance Machine Works

FRANKFORD, PHILA.

JOSEPH T. PEARSON & SONS CO.

MANUFACTURERS OF

BONE DRY HOSIERY FINISHING BOARDS

THAT WORK ABSOLUTELY SMOOTH

PROMPT SERVICE—RIGHT PRICES

1815 E. Boston Avenue, Philadelphia

GENERAL MACHINE WORKS

YORK, PA.

Manufacturers of

Circular Rib Knitting Machinery

Cylinders and Dials

The trade still is talking about the rebuff which the 2/10/60 extra element received from Gustav Oberlaender, of the Berkshire Knitting Mills, in the conferences with jobbers during the convention of the National Association of Hosiery and Underwear Manufacturers. The Berkshire sells only on terms of 10 days net, and about six weeks ago closed contracts for its entire production from July to December. Not only this, every jobber who bought must take in each month, beginning with July, a pro rate of his purchase, and his invoices will mature in 10 days after delivery of shipment to his agent, the railroad company.

"How can Oberlaender get away with it?" persons in the trade have asked.

"His mill is not a criterion; it stands unique; really it does not offer its goods, it simply notifies customers when lines will be ready and advises them how many dozens have been allotted to them," is the reply, in substance, that frequently is heard.

This is absolutely correct, and this is not the first year that the Berkshire pursued this policy. Several years ago, after the market had dropped sharply, when distributors were worrying over prospective heavy losses on silk hosiery in stock and on contract, the Berkshire startled the entire domestic knitting trades by announcing a substantial rebate on all goods remaining on order. Perhaps that explains why the mill can sell on terms of 10 days net. So there are phases of a transaction which some jobbers appreciate more than unreasonably long terms.

To bring the cost of silk hosiery to a minimum, Mr. Oberlaender points out, raw silk must be bought on practically cash terms. One way to get the maximum of results from employees is to treat them humanely and pay them their wage every week. This the Berkshire does, and to sell on terms of 2/10/60 extra, Mr. Oberlaender told the jobbers, would compel his mill to borrow $2,000,000—what for? to carry distributors who might be assumed to have planned, as the Berkshire has, to finance their transactions themselves.

Long terms open the door wider to cancellations. If the market declined in, say, a month after goods had been bought by a distributor on terms of 60 days would he cancel? Experience teaches that a considerable number would. More failures will occur in 60 days than in 30. There is just as much wrangling at the end of 60 days as at the expiration of 30, if the market is just a bit wobbly. As it is, some of the Philadelphia small jobbers who did manage to buy on 60 days found fault with the goods and managed, by urging one contention after another, to postpone payment for perhaps 90 days. Quoting some one who was heard from long years ago, Mr. Oberlaender says, "Short terms make long friends," an aphorism that admits of no dispute. The Oberlaender mill is not the only one adhering strictly to 10 days net, but there are not many of them.

Several weeks ago it became noised about in the Philadelphia cotton yarn trade that a large manufacturer had contracted for yarn on terms 2/15/30 extra, under which he could take discount at the end of 45 days. It was observed that if one buyer could obtain such terms others would be entitled to them from the same seller, and there were threats that if anyone, spinner or mercerizer, was shown to have broken away from the requirement that invoices mature on the 10th of the following month, as has been the custom, the matter would be aired in his trade organization. The proposal that spinners sell on more liberal terms was an outcome of the raid of a few jobbers for 2/10/60 extra. "If a jobber need money for carrying on his business, I might be willing to consider a loan, but never will I sell on such terms as he is asking from hosiery manufacturers," said a merchant of yarns.

Underwear has been selling on terms of 60 to 70 days, but sales have not been any larger, relatively, than have sales of hosiery on terms of 30 days, so that it would appear long credit does not promote legitimate buying. It invites speculation, and the speculative buyer is to be shunned while cotton, silk and wool are so high as to invite attack on the tariff bill pending in congress.

Toward the latter end of June retailer demand, not terms, was selling hosiery. And it was noteworthy that buying for export had increased in about the same proportion as for the domestic markets. Orders for 5,000 to 20,000 dozens of cotton hosiery for foreign account were booked by at least two New York commission houses in the same week, and one concern entered a contract for 1,800 dozens of ladies' seamless silks. Back in April there was a significant increase in exports over the monthly shipments last year, and it looks as though the increase will be more than sustained for May and June, months for which official statistics had not been received at this writing.

Low end cotton hosiery still is selling for too little money. The explanation lies not so much in the absence of buying as in excess production. But one hears little of low prices in retail stores as a sequence of mills yielding their profits in the moving of goods for replenishing capital. The price of a southern-made carded stocking for women was one dollar a dozen several weeks ago, and there have been no reports of an advance. The mill making the stocking has as low overhead—probably lower—than any other manufacturer of identical lines. But it was selling at the old price, notwithstanding yarns are eleven cents a pound higher than when the price was named for the season's opening. The executive of this mill says the stocking, weighing 24 ounces to the dozen, cannot be made at a cost of one dollar a dozen in his establishment, and that his only reason for selling at that price is the fact others are quoting it. Either the mill had a fancy profit on low price yarn or is having none at all on yarn at present cost. Perhaps in the struggle for the survival of the fittest the management is averaging its profits and losses in the expectation of coming out about whole for the year.

Hope that a turn for the better is on the way is extracted from the fact several mills have withdrawn their lines—that is, they are not quoting prices. Two numbers of combed hosiery were taken off the market by one concern, and another is not quoting on either of two lines of mercerized. A mill making combed hosiery which has been operated full time for the last two years is declining orders specifying immediate shipment, having sold up on most of its numbers for 30 to 60 days. The mill has been selling for immediate and nearby deliveries until it now is in arrears. This happens to only mills whose lines are strongly entrenched with the more desirable jobbers, as for illustration, a Pennsylvania brand of double sole combed half hose. At least one southern mill selling to jobbers is in this class.

A New York commission house selling for several mills which are not in this category and which are not getting value for their product, several weeks ago broadcasted a

letter to jobbers which quoted 176 needle automatic top half hose, with sewed toe at 72½ cents, an advance over the former price of 2½ cents, and women's 176 needle cut toe at one dollar, an advance of five cents. Men's 144 needle socks were quoted at 80 cents, against 77½ formerly, and misses' combed yarn 300 needle ribs at $1.60. Comparisons should not be made with these prices, all of which are so low as to leave the impression that the mills were in need of funds. One of the ten lines offered by the house are sold on terms of net 10/30 extra. The exception is sold 2/10. By the time the circular reached the trade, notice was received by the commission house of the withdrawal of three lines.

Silk hosiery is brisk in spots, weak in others; a very few mills making seamless goods have found it expedient to turn down some of the business offered at mill prices. A leading jobber submitted an order for approximately 9,000 dozens at a price almost one dollar a dozen under that of the mill. "We can buy at the price mentioned; the business is yours if you can match it," the buyer wired. It is assumed the price stated by the buyer never had been accepted by any mill, for the character of goods desired is in strong demand.

Full fashioned silk hosiery is movable at current prices, varying by a dollar a dozen among mills making like goods. A low price for standard silk boot stockings with mercerized top, heel, sole and toe is $13.50 a dozen. The mill which named this price is sold ahead for the remainder of the year. A somewhat similar stocking is priced a dollar higher by a few mills, which also are getting a goodly share of business.

Jobbers express the opinion that there is prospect of overproduction of full fashioned silk hosiery. This would seem possible, considering the continued additions to mill equipment. But the demand for full fashioned machines is ahead of output in this country, which thus far has not been affected by competition with foreign built machines, a number of which have been installed and others to be installed by American mills. Direct-to-retailer mills making full fashioned silk are selling their production, and the salesmanager for a given territory, embracing Pennsylvania, Maryland, West Virginia and Western New York has been selling more than was allotted to him by his mill. In the territory mentioned more than 100,000 coal miners were on strike and as many steel mill workers were out of employment for reasons beyond their control.

Taking the business of the retailer mills as an index, conditions may be said to be very good, considering the basic situation. It is stated by the sales manager for three spinning mills making double carded yarn that in May, when his sales were unexpectedly large, 70 per cent of the purchases were by direct-to-retailer underwear mills.

Hosiery mills selling direct have been taking the lead in the bringing out of new styles, their innovations extending to mixtures, character of fabric and color combinations. A recent innovation for misses' ribs is roll tops in plaids instead of stripes. A top, combining say three colors, may be applied to either of several shades of stocking, so that the matter is perfectly simple when samples have been gone over by buyers and their opinions assembled. One mill, after bringing out something different, invariably manages to have conferences with buyers for large stores scattered among the larger cities, and in this way gets an approximate idea as to what among the samples may be depended upon as good selling numbers. Buyers like to be consulted and the mill gets the benefit of the best judgment. At times the mill has as many as eight or ten samples being knitted on one class of machines which hitherto were kept running on a single number. It is a question whether designing does not take first rank as a factor in hosiery selling, the sales force in second place.

A small mill recently established in Norristown, Pa., operating Wildman machines on silk fabric for underwear, several weeks ago began the making of ladies' stockings from this fabric. The stocking is cut and sewed, as with hosiery made from Italian or glove silk, and is described as full fashioned. Probably a more appropriate term would be "tailored."

A Burson-knit low end heather stocking for ladies, costing retailers $4.25 a dozen, was advertised by a Boston dealer as of dollar value, but offered at 69 cents a pair, yielding the dealer about 94 per cent profit. The line was brought out as a 50 cent retailer. Jobbers are beginning to find fault with retailers for exacting exorbitant profits while complaining the public will not pay higher prices.

There is promised a departure for next spring from the hitherto popular infants' socks of mercerized yarn with fancy roll tops, several mills having planned to discontinue this class and bring out plain leg in single shade, in both regular and three-quarter length, with jacquard roll tops, similar in all respects to the now popular misses' ribs.

That there is to be no dearth of ladies' hosiery of silk and wool in combination for Fall is indicated by continued sampling, with which some of the leading worsted spinners are kept occupied a great part of the time. In fact, spinners are amazed at the number of mixtures and color schemes. With the prospect ladies will be partial to low shoes for winter, hosiery in the pastel shades in silk and wool mixes is regarded a coming favorite, and thus far among the light tints none seems more popular than nude.

According to several Englishmen identified with the British textile trades who were in attendence at the knitting arts exhibition in Philadelphia in May, American buyers have been cancelling with much freedom orders placed in England early in the year for wool hosiery. This was stated by the men from Leicester to have been due in part to advanced prices named by British manufacturers following the higher values on wool.

It might be assumed that cancellations abroad would lead to better demand for American hosiery of the same class, but recently there were a few cancellations by small jobbers. For the present, leading manufacturers of the better types of wool hosiery are not offering their lines, withdrawals following a flood of cancellations from various quarters soon after the buying hysteria which reached its wildest period along in January. It is possible some of the cancellations for seamless silk and wool in combination were submitted when it became apparent that full fashioned mills were planning to knit stockings in the popular mixes.

Little or nothing has been heard about the opening of infants' socks for 1923. Buying for the current season was in progress last year as early as July. If any has been bought for next year the transactions remain a secret as between the sellers and buyers. One mill, which is receiving no 1923 business and has about completed this season's deliveries, is working up yarn in stock, after which, unless buyers begin to talk seriously, operations will be sus-

pended. It seems unlikely manufacturers will buy yarn simply for keeping machinery running; that not until the trade is ready for finished goods will mills take on high price yarns.

Several of the more important hosiery and underwear buyers have been saying they were about ready to operate along more nearly normal lines, and it is expected a number will be in the market by the middle of July.

Do not open until buyers are ready to operate, is the injunction of one of the foremost underwear primary market operators in relation to next Spring. It is his thought that, in the present market condition, no wise manufacturer would feel like selling his low price yarn put into underwear at prices which some jobbers have indicated will be their limit, and he could not meet these prices with yarns bought now. Buyers will pay adequate prices when they find they must, to get desirable goods. They will not do so while underwear to go over the counter eight to nine months hence is being shoved under their noses. "Wait until they show some anxiety," it is suggested by a manufacturer who will not name prices before the latter part of July, regardless of what others may do.

Some underwear for 1923 spring has been sold, but buyers are not telling all they know about such transactions and sellers have been moving about the market with gum shoe quiet. Several manufacturers who went out in advance of the formal opening for next Winter skimmed a considerable part of the cream of the business, and sellers who are out for next Spring are but following their example, in the expectation the first skimming will be the richer.

A New York State mill has sold some Spring goods, and a Central West mill was in the market quite recently for yarns, leaving the impression that underwear from that mill also will be offered very shortly.

There has been a drifting from organization sentiment on the matter of season openings for the last several troublous years, and it seems that this year prices and samples will come out when manufacturers individually feel their trade is ready to operate.

A few lines of Summer underwear are selling in a moderate way at slight advances over last year's opening, which should not be surprising, in view of the upward movement in cotton and yarns. On the other hand, low end stuff, ladies' pants and vests, a product common to many of the small mills in one section of Pennsylvania, has been offered at concessions. An accumulation of several hundred cases looks momentous to the heads of some of the less affluent mills, and when jobbers did not rush to market for more goods with the advent of real Summer weather, with temperatures running in the neighborhood of 90, it was undertaken to stimulate interest by naming price concessions. The result was not satisfactory, and a few holders say they fear they may have underwear in stock for the Spring of 1923. Many of the Pennsylvania mills are operating but three days a week. As none of the jobbers has bought for anything like normal requirements it is possible the affected manufacturers were unnecessarily alarmed; that in the next six weeks their accumulated stocks may be absorbed.

Underwear for winter has been receiving more attention since the June 2nd cotton acreage and crop condition report came out, and seems likely to occupy the center of the stage for a time. Estimates are heard that more than 50 per cent of what normally is required remains to be bought. One jobbing house buyer says he doubts whether the aggregate commitments exceed 30 per cent of last year's purchases. But, he declares, he will buy none until his house has sold what it has in stock. Retailers, it is represented, are holding off, and this is supported to some extent by reports from mills selling direct.

The average retailer cannot be scared into buying early by telling him it may be difficult to get proper deliveries if all merchants defer their commitments much longer. He believes, or affects to believe, that mills are loaded to the roof with underwear and that dealers will be able to get all they want whenever they call for it—if not from one, from another. If the jobber had confidence in the retailer he would buy to protect him. He is letting the mill carry stock for protecting both jobber and retailer. If mills do not increase prices in the event demand becomes sharp late in the distribution there will be a number of manufacturers entitled to crowns as philanthropists.

Buyers who recently placed their initial Winter orders were free to say they thought they had waited as long as it was safe to wait. There has been enough of first purchasing recently to evidence increasing anxiety on the part of distributors, some of whom are known to be buying to cover sales already made to retailers. Deliveries usually specified are July, August and September. It is predicted more underwear will move into distribution in September and October than in any three previous months this year, and a jam is regarded not unlikely.

Southern mills making sub standard union suits and shirts and drawers were recipients of considerable new business in June, these mills being beneficiaries of retailer resistance to price. "If you cannot reduce your price," a retailer said to a jobbing house salesman, "buy cheaper or lighter weight garments."

One manufacturer, buying yarn for 16-pound suits, thought the only way out for him was to lop off a pound per dozen, with permission of his trade. The wearer would be as comfortable in a suit weighing 1⅓ ounces less, and probably would rather have it at the price of last year than pay a nickel advance. There seemingly is more aversion to paying a trifle more for quality than taking less quality at prices as they were, and retailers are helping this spirit along.

Not one-half the normal sweater coat buying for Winter has been done, and it looks as though the last half of the purchases will be at higher prices than now prevail. Manufacturers say advances are certain some time in July, and already some lines, for which stocks of yarn have been used up, have been discontinued, mills buying no yarn and making only such garments as can be produced from yarn in stock or on contract. The flight of wool prices left the sweater trade in somewhat of a plight. Worsted yarns are regarded too dangerous at current quotations to buy for stock, and as distributors take the same view of sweaters, Fall will find all hands illy supplied, with either yarn or finished garments.

Howard Brothers Manufacturing Company, card clothing manufacturers, have opened a repair shop in Atlanta, Ga., to be equipped for rewinding licker-ins and re-clothing card flats. Guy L. Melchor, representative of the company, has supervision.

STANDARDIZE ON

DIXIE YARNS

C. P. Mercerized Cones and Skeins
Natural and Gassed
20/2—80/2

DIXIE MERCERIZING CO.
CHATTANOOGA, TENN.

Our yarns are spun according to our own specifications.

LET US QUOTE YOU.

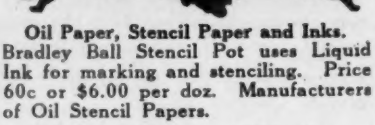
An Ever
Increasing Demand
For
"AMTEX"
SPINNING, TWISTING AND SPOOLER TAPES
From
Southern Spinners
THE QUALITY AND PRICE RECOMMEND THEM
Manufactured by
AMERICAN TEXTILE BANDING CO., Inc.
GERMANTOWN, PHILADELPHIA, PENNA.
Sold in the South by
Charlotte Supply Co., Charlotte, N. C.
James Supply Co., Chattanooga, Tenn.

SOL-ESCO
FOR BOILING OUT COTTON GOODS
Saves 30% to 50% on Time
Insures Level Dyeing—No Resists
Reduces Caustic .... and Danger of Damage
Write for visit of Representative.
Electric Smelting & Aluminum Co., Inc.
Lockport, N. Y. Detergent Specialists

The Walke Box Company, Inc.
NORFOLK, VA.
Manufacturers of
NORTH CAROLINA PINE BOX SHOOKS

Rectangular Tank
Lead Lined or Plain
WOODEN TANKS FOR EVERY PURPOSE
Outlast Steel

"We Win with Quality"
Quality is inbuilt in every wooden tank leaving our factory. No matter what your requirements for tanks, we can meet them to your entire satisfaction with Hauser-Stander Quality-Built Wooden Tanks.
Constructed of genuine red gulf cypress (the wood eternal), Hauser-Stander wooden tanks will outlast the best steel tanks made.
For the last 50 years, Hauser-Stander tanks have been acknowledged best, and our policy is "Satisfied Customers Only."
Let us quote you on your requirements.
The Hauser-Stander Tank Co.
CINCINNATI, OHIO
Pittsburgh Office: 506 Bakewell Bldg.

Bradley Stencil Machine
The Bradley Stencil Machine makes Stencils in half a minute at reduced cost of 1-10c each. Write for catalogue and price list.
In universal use by thousands of manufacturers and shippers.


Oil Paper, Stencil Paper and Inks.
Bradley Ball Stencil Pot uses Liquid Ink for marking and stenciling. Price 60c or $6.00 per doz. Manufacturers of Oil Stencil Papers.
Write for Prices and Samples
A. J. BRADLEY MFG. CO.
99 Beekman Street NEW YORK

The Yarn Market.

Continued increases in rates asked by spinners featured the Philadelphia cotton yarn market during June. About the first of May, yarns in this market seemed unable to stand it any longer, and yielded to the several bullish influences pressing upon them and started upward. The elevation of the price levels was continued during the following month, until the present writing finds all yarns in the published quotations on a basis of from three to five cents above that prevailing in the list published here last month.

The apparent cause for the sprint in rates made by yarns were the bulges which came in raw cotton quotations during the month. Cotton on all markets picked up considerably, and with each rise quoted for the raw staple, yarns accordingly took on additional value as quoted in the market. Several times during the month factors who were bearish concerning prices expressed the opinion that yarns had reached the peak, and then, as if in disdain, yarns would go up again. Another factor which, it was pointed out, possibly had to do with the increases, was the fact commented on before in these reports—that the spinners have for a long time indicated they were many of them operating on a profitless basis, while others were absorbing losses in disposing of their product at prevailing prices, and that the point of saturation on the part of these mills evidently was reached and the spinners were making a determined effort to regain some of the ground lost.

This at least seemed evident in the manner and persistency with which prices were elevated. Each week recorded a substantial increase in spinners' quotations, and now their determination for still better rates seems unabated.

This in spite of the fact that the rising quotations seemed to have a hindering effect on buying, for when the increases began to appear in notable quantity, the consuming end seemed to disappear from the lines of activity and the sellers had it all to themselves. It was true, as in all times, that some buying was done, but it was of a desultory character and no startling developments occurred. In fact, the sudden and radical action of the spinners in lifting their quotation levels seemed to be the only development of interest in the market during the month past, all other factors of the trade pursuing their more or less normal course. Consumers appeared to be interested in yarns only to complete their own orders, and the spinners were equally adamant to influences tending to force prices to a lower scale.

During the period from May 17 to June 16, advances in representative counts were as follows: Southern single skeins, 20s, from 34 to 37 cents; southern single warps, 30s, from 38½ to 43 cents; southern two-ply warps, 20s, from 35 to 38 cents, with other counts in proportion.

Quotations published on June 16 for the Philadelphia market follow:

Single Skeins.

4s to 8s	32½	10s	33½
12s	34	14s	34½
16s	35	20s	36½@37
24s	38	26s	39
30s	42@43		

Single Warps.

8s	33	10s	34
12s	34½	14s	35
16s	35½	20s	37
26s	40	30s	43
40s	55@57		

Carpet and Upholstery Yarn in Skeins.

8s and 9s 3-4 slack	33@34
8-2-3 tinged tubes	29
8-3-4 hard white warp-twist	32
8-3-4 hard twist waste	23@30

Two-Ply Skeins.

8s	32@32½	10s	33@33½
12s	34	14s	34½
16s	35@35½	20s	36½@37
24s	38@38½	26s	39@39½
30s	41@42	40s	55@56

Two-Ply Warps.

8s	33½	10s	34½
12s	35½	14s	36
16s	36½	20s	38
24s	39	26s	40@41
30s	43@44	40s	56@57

Two Ply Combed Peeler Skeins and Warps.

8s to 16s	53	20s	55
24s	57½	30s	60@62
40s	75	50s	85
60s	95@$1.00	70s	$1.05
80s	$1.15@$1.20		

Frame Spun Carded Yarn on Cones.

8s	33½	10s	34
12s	34½	14s	35
16s	36	18s	36½
20s	37@37½	22s	38
24s	38½@39	26s	39½@40
30s	41@42	40s	55@56
30s double carded			45@47
30s tying-in			38@39

Mule Spun Carded Yarn.

10s	38	12s	38½
14s	39½	16s	40
18s	42	20s	43
24s	44@45	26s	46@47
30s	49@50	40s	59@61

Mule Spun Combed Peeler Yarns on Cones.

10s	49	12s	50
14s	51	16s	53
18s	54	20s	56
22s	58	26s	62
28s	66	30s	68
36s	78	38s	79
40s	83@86		

Among the Knitting Mills.

The Forsyth (Ga.) Hosiery Mills have taken over the Southern Hosiery Mills at East Point, Ga., the plants being consolidated and C. T. Smith, former owner of the Southern Hosiery Mills, is now superintendent of the organization. Since the consolidation of the mills the manufacture of silk hosiery has been taken up, and silk and cotton hose of various colors are being manufactured.

The Silk Tie Knitting Co., Knoxville, Tenn., has been incorporated, for the manufacture of knit neckties and other products. V. H. Spuill, Ira T. and Roy C. Bean, C. H. Keifer and D. F. Bowman are the incorporators.

Report is to the effect that a knitting mill will be established at Calhoun, Ga. Plans are on foot to merge the Calhoun Yarn Mill with the proposed organization. L. R. Pitts, A. R. McDaniel, Rev. Chas. S. Henderson and others are a committee to investigate the proposition.

Damage estimated at $30,000 was caused by fire which swept the plant of the Talladega (Ala.) Knitting Mills recently. The fire originated in the finishing department and stock room and everything in this department was a total loss. The blaze spread to the knitting room, where much damage to the machinery resulted from fire and water. While the fire was largely confined to the finishing department, damage resulted in every part of the mill except the dye room. The origin of the fire was not known.

J. T. Brownlee and associates of Knoxville, Tenn., have purchased an option on the Appalachian Mills, Knoxville, underwear manufacturers. The common stock was purchased for $800,000, while preferred stock, in the sum of $400,000, has been disposed of with the exception of $100,000, it is stated. The mills are now operating under the new management, with Mr. Brownlee as president of the company.

The Wiscasset Mills Company, Albemarle, N. C., are arranging for equipment for the manufacture of full-fashioned hosiery, it is reported. C. W. Gaddy is in charge.

The Dallas Hosiery Mills, Dallas, Texas, have changed their knitting equipment to individual drive.

The Hoover Hosiery Mills, Concord, N. C., are reported considering entering into the manufacture of full-fashioned hosiery.

The Williams Knitting Mills, New York City, recently organized with a capital of $5,000, will operate a local plant. The company is headed by B. Brandler and L. Golder.

The Quality Hosiery Mills, Inc., New York City, has been formed with a capital of $25,000, to manufacture hosiery and other knit goods. The company is headed by B., I., and S. K. Kahn.

The Thomson Knitting Co., Bowmanville, Ont., has taken bids and will soon break ground for the erection of a new mill, estimated to cost about $90,000, including equipment

The West Knitting Corporation, Syracuse, N. Y., has been incorporated with a capital of $300,000, to operate a local knitting mill. Officials of the company include E. and C. H. West, and L. R. LeFrance.

Organization of the Posner Knit Wear Company, New York City, has been effected. The company has a capital of $5,000, and is headed by A. J. and E. Posner, and J. Leicher. Headquarters will be at 404 Fourth Avenue.

The Columbia Manufacturing Co., Jersey City, N. J., has been organized with a capital of $50,000, to operate a local plant for the manufacture of knit goods. The company is headed by Carmello Livoli.

A knitting mill is to be operated by the Lang Knitting Mills, Inc., New York City, which has been organized with a capital of $200,000. J. Lang and H. Gropher head the company. It is represented by M. Sheinart, 39 Broadway, New York.

The Mechanicsburg (N. Y.) Hosiery Mills, Inc., were recently organized to operate a hosiery mill. The capital is $65,000.

The Century Knitting Co., Hemlock St. and Sherman Ave., Hazelton, Pa., is arranging for the erection of a new one-story mill addition for increased production.

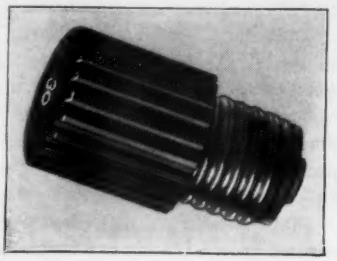
The Sylvan Knitwear Mills, Inc., Brooklyn, N. Y., was recently organized with a capital of $20,000 to operate a knitting mill. The company is headed by I. Miller, M. W. Rosen and I. Saffran.

A New Fuse Plug.

The Federal Electric Company have recently placed on the market a new renewable powder packed fuse plug, very novel in design, which they claim will not only save the blowing of a great number of plugs because of the time element feature, but also will save hundreds of thousands of dollars by preventing small motors and apparatus from being destroyed.

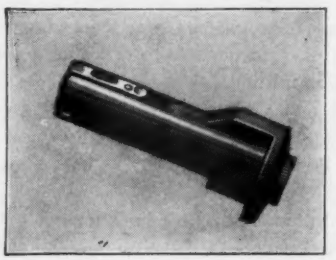
Their time element feature and powder-packed renewable element which they use in the fuse plug, solves the problem of taking care of the excess currents of short duration due to starting torque and small line surges; eliminating the necessity of using a plug three to four times the rating required to take care of the normal running current in order to withstand the short duration excess currents.

Its construction—only three parts—is very simple, yet effective. The parts are the outer case, the cartridge holder, and the powder-packed renewable cartridge; it can be reloaded in but a few seconds without the use of any tools. The plug is built very rugged to withstand innumerable short-circuits and ordinary overload blows, without injury to the holder itself. Likewise, very large contact surface and substantial metal is used to give the best of contact. While the plug is a renewable plug, only the cartridge element furnished by the manufacturer can be



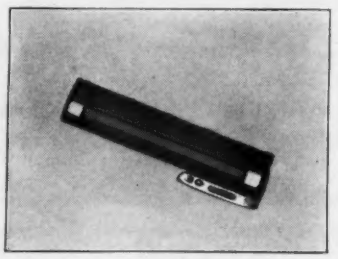
used. This insures an absolutely fool proof plug that cannot be accidentally or intentionally overloaded.

This new plug is called the "Federal Three-Thirty" renewable fuse plug. Its distinct advantage is its absolute dependability in withstanding the short excess currents due to high starting torque and the small line surges and yet



its positive accuracy in blowing within the required time to protect the apparatus. The same renewable element is used in their regular 3-30 ampere 250 volt cartridge fuse.

While their new device brought out some six months ago, namely, the Federal-National multiphase time limit renewable fuse (for protecting polyphase circuits against single



phasing, as well as furnishing fuse protection) has gone over in a big way, they anticipate within a very short time that the new time limit renewable powder packed fuse plugs will necessitate enlarging considerably the department devoted to fuse protection.

The effect of color on individuals has been worked out by A. C. Rapp, of Pittsburgh, in a bulletin of the Paint Manufacturers' Association. Colors seem to have the following psychologieal effect: Black—Melancholia, decreased work. Red—Temporary stimulation followed by reaction accompanied by nervousness and headaches. Blue—Calmness and seriousness. Green—Increased vitality, happiness. Yellow—Increased vitality, amiability.

SANDOZ

ANILINE DYES FOR ALL TRADES

We carry a complete line
at all branches.

For samples and prices apply to any of our offices

SANDOZ CHEMICAL WORKS
INCORPORATED

238-240 Water St.
NEW YORK

36 Purchase St.
BOSTON

12 So. Front St.
PHILADELPHIA

175 Market St.
PATERSON

Commercial Bank Bldg.
CHARLOTTE, N. C.

The Years Can't Dim its Whiteness

Dixielite is the brightest, whitest mill white made. And it stays white. The years cannot turn it yellow nor make it chip, crack or peel. It's washable.

Dixielite attracts and reflects more daylight and lasts years longer than any other mill white made. Write for Booklet No. 51 "Keeping in the Spotlight."

EXTERIOR Surfaces of brick, cement and stucco need Bay State Brick and Cement Coating. It beautifies and waterproofs. Write for booklet.

WADSWORTH, HOWLAND & CO., INC.,
139 Federal Street, Boston, Mass.

Branch Stores in the Principal Cities.

New York Office, 211-219 Forty-Seventh St., Brooklyn, N. Y.
Philadelphia Office, 1524 Chestnut St.
Southern Office, Greenville, S. C.

DIXIELITE

AUTO GYP
Process of Dyeing

Eliminates All Bleaching

THE AUTOGYP PROCESS OF DYEING entirely eliminates the troublesome bleaching operation.

AUTOGYP bleaches and dyes to the required shade in ONE operation of THREE HOURS time.

Evenly dyed shades, stronger, better looking fabric with softer feel are the results of substituting this process for the old method of dyeing and bleaching separately.

AUTOGYP SAVES:

Six separate steps and operations.
3½% of shrinkage.
25% of tensile strength.
50% of steam.
30% of labor.
90% of water.

It saves all the chemicals used in the chloride of lime method of bleaching. It saves boiling out in kiers or other appliances. It saves from 4 to 17 hours time, as it performs the complete operation to shade in THREE HOURS TIME. Compare this time with the time required in the old fashioned method.

AUTOGYP is a dividend paying proposition and we are sure it will appeal to you. Write us for more detailed information or we will be glad to have our representative call and fully explain the AUTOGYP PROCESS OF DYEING.

Surpass Chemical Co.,
Albany. N. Y.

Dyes and Bleaches

On One Operation

Sulphurous Acid Generator

Make Your Own Anti-Chlor In Your Own Mill

As an anti-chlor, the Sulphurous method is not only more economical, but eliminates all danger of goods being damaged or tendered on the dryer and it assures a uniform, neutral product. No other anti-chlorine method can produce as soft, white or brighter bleach.

You can make your own anti-chlor in the form of sulphurous acid, in your own bleach house only in quantities to meet your immediate demands. The MACOMB Sulphurous Acid Generator manufactures it at a much lower cost than you can secure it elsewhere. It saves two washings, and effects a great saving in power, labor and loss of time, and allows washers to produce more.

Can be installed to deliver to souring machine or storage tank.

Constructed wholly of lead, it is indestructible from chemical reaction and is guaranteed gas tight.

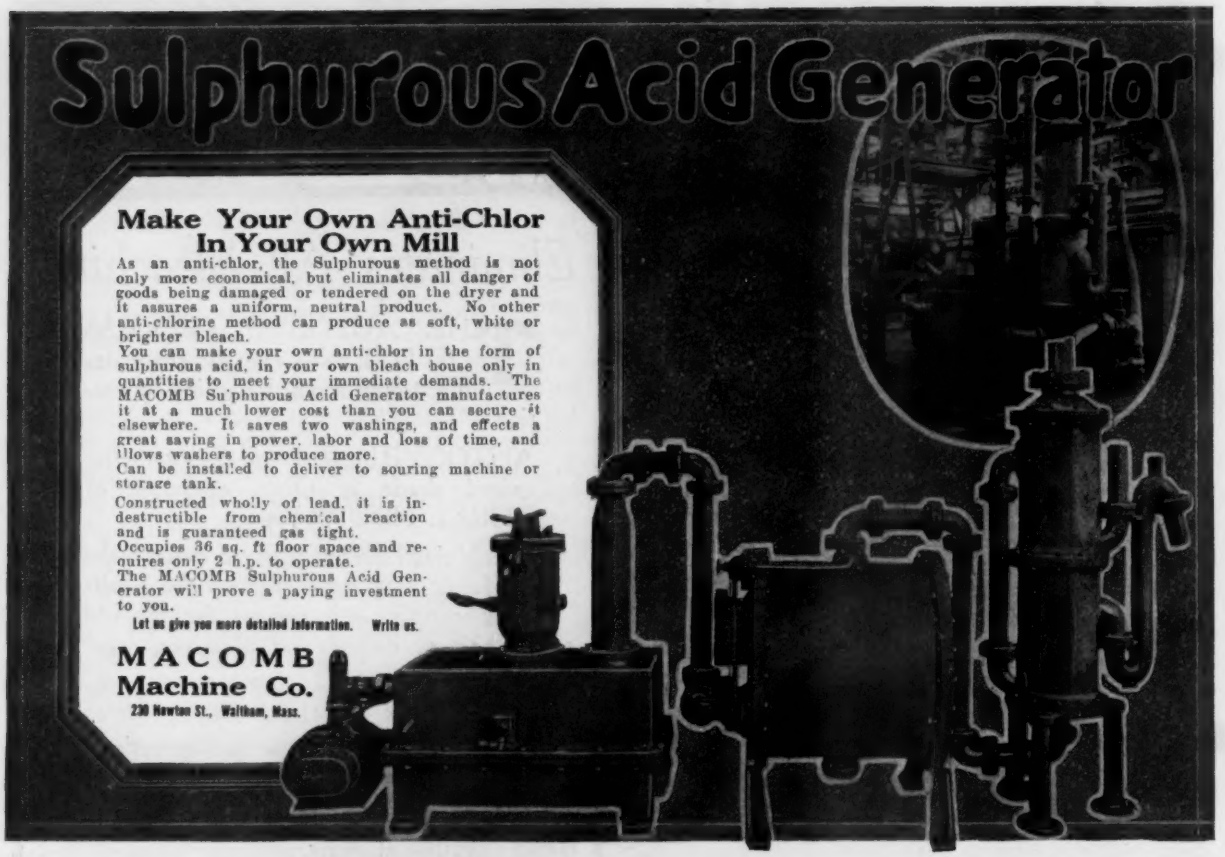
Occupies 36 sq. ft floor space and requires only 2 h.p. to operate.

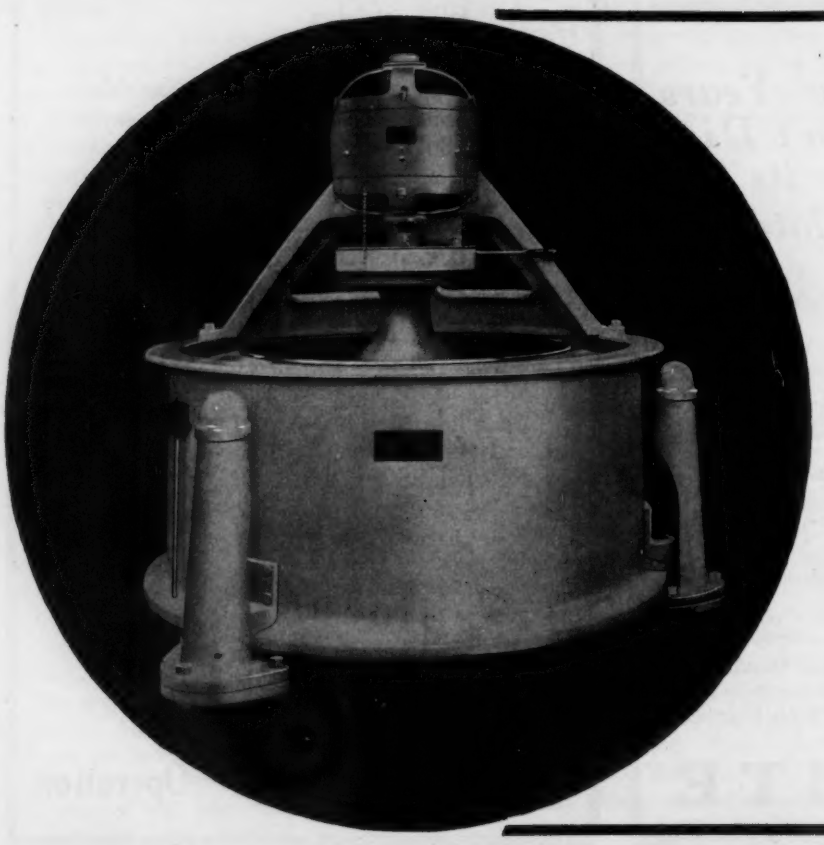
The MACOMB Sulphurous Acid Generator will prove a paying investment to you.

Let us give you more detailed information. Write us.

MACOMB Machine Co.

230 Newton St., Waltham, Mass.





The Safety First Extractor

"Hercules-Electric"

SIZES 6" to 72"

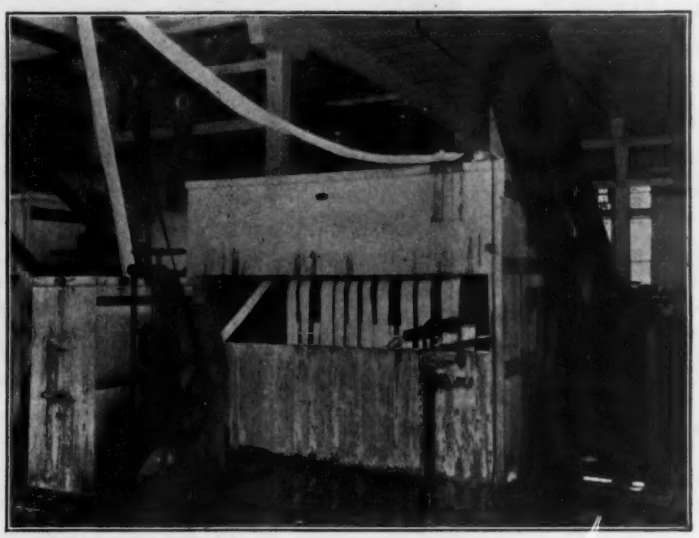
EAST JERSEY PIPE CO.

PATERSON, N. J.

GREENVILLE, S. C. E. S. Player, Masonic Temple

LOS ANGELES, CALIF. A. Walton, 1513 Westmoreland Ave.

CANADA Whitehead Emmans, Ltd. Montreal



You'll probably be interested in the details of this Washing Machine and Wash Squeezer

The installation was made recently in the plant of a large finishing company in the southern district.

The Washing Machine has heavy housings with handwheels, screws and rubber spring. There are two maple rolls each 20″ diameter by 120″ face. Has friction driving pulley complete with pin rail, pit reel and bearings.

Heavy housings are found also in the Wash Squeezer. Top rubber covered roll is 18″ diameter by 22″ face. Rubber covering is 1″ thick. The brass covering on the bottom roll is the same thickness. This roll is of the same diameter and length as top roll. Drive is by expansion pulley, 21″ to 24″ by 6″ face, on overhead countershaft to tight pulley on squeeze.

But no matter what type or kind of finishing machine you are interested in, you will find helpful the 102 years of experience behind the Butterworth line—*and it's yours for the asking.*

FINISHING
Butterworth
MACHINERY

H. W. BUTTERWORTH & SONS CO.

Established 1820

PHILADELPHIA, PA.

Canadian Representative, W. J. Westaway Company Hamilton, Ontario, Canada.

Greenville, S. C., Office: Masonic Temple Building. Milton G. Smith, Mgr.

Providence Office: Turk's Head Building.

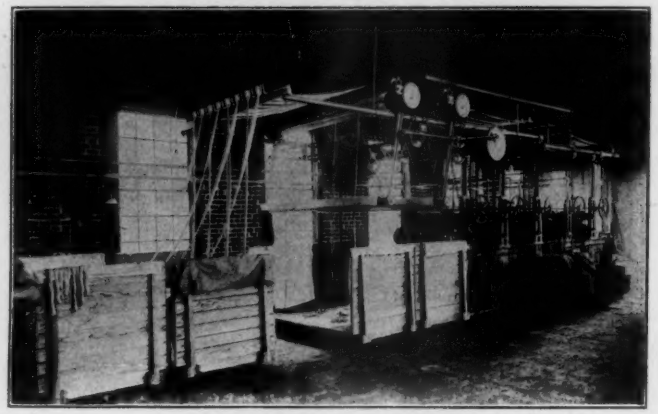
Butterworth Products:

Ageing Machines	Mercerizing Ranges	Soaping Machines	Calenders (all kinds)
Bleaching Machines	Hydraulic Presses	Tentering Machines	Color Kettles
Drying Machines	Dyeing Machines	Mangles (all kinds)	Cell Dryers
Singeing Machines			

Five Compartment

WARP DYEING EQUIPMENT

Continuous System Method



DYES DuPont **Napthanil (Red-Pink-Blue and Orange)** in One (1) Run through the machine, and Dyes all Vat Colors **in Two (2) Runs,** producing absolutely level shades, and handles the warps in such a manner as to leave them in the very best possible condition for beaming and weaving.

The successful handling and dyeing of Warps by a Continuous System Operation is only made possible by the use of specially designed Tension Controls, etc., built and used by us in the various Continuous System Warp Dyeing Equipments which we build for all colors, including Indigo.

COCKER MACHINE & FOUNDRY COMPANY

Gastonia, North Carolina

Specialists in Designing and Manufacturing Machinery for Making and Handling of Warps

DESIGNERS AND BUILDERS OF

WARPING MACHINERY		WARP DYEING MACHINERY		WARP BEAMING MACHINERY	
Linking Warpers	Indigo Vats	Sulphur Vats	Warp Coilers	Long Chain Beamers	
Balling Warpers	Boiling Boxes	Sizing Machines	Scotch Systems	Short Chain Beamers	
Beaming Warpers	Wash Boxes	Continuous Systems	Dye House Ballers	Warp Splitters	

Is Your Drying Operation Profitable?

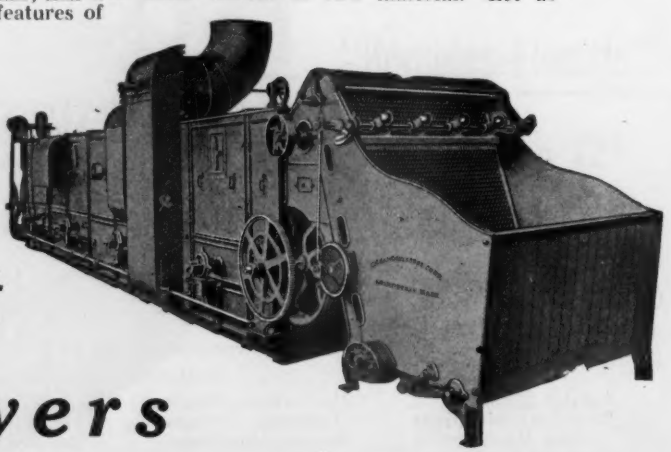
Have you ever considered whether your present drying system is as economical as it should be? How much time, labor, steam and floor space are involved in your present output?

SARGENT DRYERS embody so many superior characteristics of economy and our 50 years experience have produced a dryer that will truly make your drying operation a profit to you.

For drying cotton, linters, wool, hair, flax and other classes of raw material. Let us tell you more about the superior features of the SARGENT DRYER.

Write today for catalog.

C. G. SARGENT'S SONS CORP.,
Graniteville, Mass.
FRED H. WHITE, Southern Agent,
Charlotte, N. C.



Sargent Dryers

DRYING MACHINERY

for Textile Raw Stocks, Yarns and Fabrics of all kinds—built and sold with the knowledge that we, the largest producers of dryers, have a reputation to maintain which necessitates our giving matchless value in equipment and service for the purchase price.

Write for a catalogue

PROCTOR & SCHWARTZ, Inc.
Formerly The Philadelphia Textile Mach'y Co.
PHILADELPHIA, PA.

"Proctor" DRYERS
The best dryers in the world for TEXTILES

Tycos temperature instruments

INDICATING

RECORDING

CONTROLLING

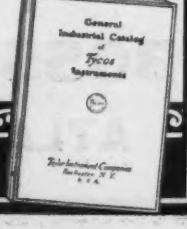
"The most important points about slashing," writes a well known authority, "are the judicious control of temperature in the cooking, application and drying of the size."

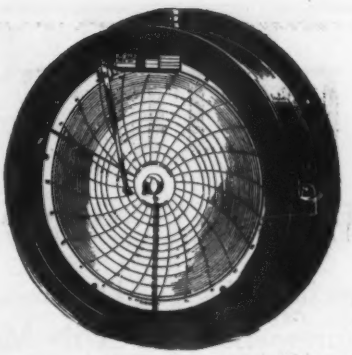
Tycos **Instruments solve other temperature problems in the Textile Industry just as easily.**

822

Taylor Instrument Companies
Rochester, N.Y. U.S.A.

There's a Tycos and Taylor temperature instrument for every purpose





What We Can do to help You—

Long experience has shown us that there are many textile power-house, dyehouse and finishing departments where the use of Recording and Controlling Instruments results in reduced expense and definite improvement in operation.

We make Indicating and Recording Liquid Level Gauges, Thermometers, Pressure Gauges, CO_2 Recorders, Temperature Controllers, etc., for use on:

SIZE BOXES
DYE TUBS
BLEACHING KIERS
SLASHERS
DRYING MACHINES
KETTLES
STEAMING BOXES
DRYING CANS
WOOL-WASHERS;
and for the POWER PLANT

Foxboro Temperature and Pressure Recorders have the improved helical tube movement, clock with three point support and jeweled balance, spring tension chart holder, and other valuable features which make for convenience, dependability and long life. Foxboro Temperature Controllers are easy to adjust, sensitive and positive in action. These instruments are giving efficient, economical service in hundreds of textile mills.

Foxboro experts stand ready to consult with you on your particular problems. They recommend a Foxboro installation only when it will result in actual saving to you.

The quality of our service equals the quality of our instruments.

Let us help you. Write to Dept. "A. S."

THE FOXBORO CO., INC.

FOXBORO, MASS., U. S. A.

New York Chicago San Francisco Tulsa
Pittsburgh Philadelphia St. Louis Birmingham

FOXBORO
TRADE MARK

118-167

FILTERS

PRESSURE GRAVITY

Especially designed to meet all requirements of Textile Mills.

Economical in upkeep.

Perfect satisfaction.

NORWOOD ENGINEERING CO.

Florence Mass., U. S. A.

CHAS. M. SETZER, Southern Representative,

Charlotte, N. C.

DURABLE K-W UNIVERSALLY USED

KLAUDER - WELDON
DYEING - BLEACHING-SCOURING MACHINERY

There are K-W machines in use which were built nearly half a century ago and which are still doing their work efficiently and economically under severe service. This is sufficient evidence of the durability and capability of K-W machines after long years of subjection to the ravages of live steam, heat and alkalis.

K-W Machinery, by its accomplishments, has steadily and irresistibly built up a reputation that has made the name "Klauder-Weldon" synonymous with the **"world's best dyeing, bleaching and finishing machinery."**

Our interest in upholding the K-W reputation means that you MUST be satisfied, and our suggestions to prospective purchasers are made with the view toward solving any dyeing, bleaching or scouring problem for all time. We will be glad to answer any and all questions without obligation on your part whatsoever.

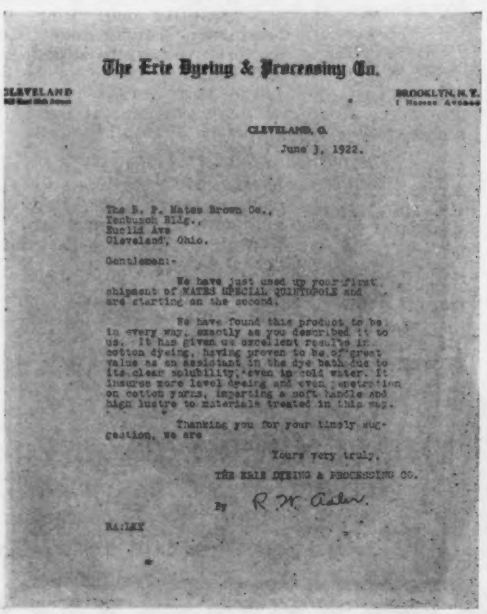
Write today for K-W Literature

THE KLAUDER-WELDON DYEING MACHINE CO.

Bethayres, Pa., U. S. A.

H. G. Mayer, Southern Agent,
Realty Bldg., Charlotte, N. C.

MATES TEXTILE OILS.



The Erie Dyeing & Processing Co.

CLEVELAND — BROOKLYN, N.Y.

CLEVELAND, O.
June 3, 1922.

The B. P. Mates Brown Co.,
Terbusch Bldg.,
Euclid Ave
Cleveland, Ohio.

Gentlemen:-

We have just used up our first shipment of MATES SPECIAL SOLUTROLS and are starting on the second.

We have found this product to be in every way, exactly as you described it to us. It has given us excellent results in cotton dyeing, having proven to be of great value as an assistant in the dye bath due to its clear solubility, even in cold water. It insures more level dyeing and even penetration on cotton yarns, imparting a soft handle and high lustre to materials treated in this way.

Thanking you for your timely suggestion, we are

Yours very truly,
THE ERIE DYEING & PROCESSING CO.
By R. M. Auler.

RA:LKF

WRITE FOR SAMPLES OF ANY OF OUR OILS AND TEXTILE SOAPS.

The B. P. Mates-Brown Co., Inc.

6007 Euclid Ave.
CLEVELAND

Soluble Grease

To make the stock yarn or warps Run Smooth, regardless of dyes that make the Cotton Fibre harsh.

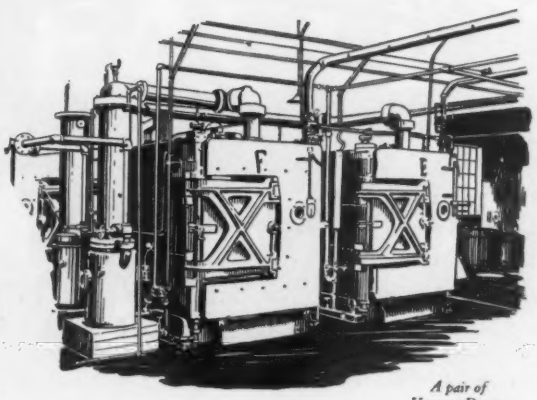
BOSSON & LANE

ATLANTIC MASS.

DUPONT

VAT ACID CHROME BASIC SULFUR DIRECT

DYESTUFFS



A pair of Vacuum Dryers

Only a few degrees between success and failure

A dyestuff may be correctly produced and precipitated, but it can be considerably dulled in shade or entirely decomposed during its drying by a sudden rise in temperature of a few degrees.

Certain dyes, because of their sensitiveness to any considerable amount of heat have to be dried under high vacuum at greatly reduced temperatures.

It is Du Pont practice, after correct production, to effect the drying of a dyestuff under accurately controlled conditions so that its desirable qualities are in no way altered, resulting in a *uniform* finished product.

E. I. du Pont de Nemours & Co., Inc.
Dyestuffs Department
WILMINGTON DELAWARE

BRANCH OFFICES:

New York Boston Providence
Philadelphia Chicago
Watertown, N. Y. Greensboro, N. C.
Charlotte, N. C.

STANDARD DU PONT DYESTUFFS UNIFORM

The Grasselli Chemical Co.

ESTABLISHED 1839
CHEMICALS
ZINC
GRASSELLI
EXPLOSIVES
DYESTUFFS

Dyestuff Dep't
117 Hudson St.,
New York, N.Y.

Sole Agents for
ESSEX ANILINE WORKS, Inc.
Boston, Mass.

KATIGEN DEEP BLACK G. G. N. CONC.

the ideal sulphur black for hosiery

SULPHUR BLACK G. A. C.

a jet shade of black for loose cotton

SULPHUR OLIVE G
SULPHUR TAN G
SULPHUR CUTCH 2 R EX
SULPHUR YELLOW BROWN 2 G

Improved types which are used successfully by piece goods and yarn dyers for production of KHAKI and BROWN shades.

Branch Offices:

Boston Providence Philadelphia Chicago
Charlotte New Orleans San Francisco
The Grasselli Chemical Co., Ltd., Toronto and Montreal, Canada.

Factories at
Rensselaer, N. Y. *Grasselli, N. J.*

Established 1815

ARNOLD, HOFFMAN & CO., Inc.

Providence New York Boston Philadelphia Charlotte

All Kinds of
HEAVY CHEMICALS
Sole Agents for
BELLE ALKALI CO.
of Belle, W. Va.
Manufacturers of
LIQUID CHLORINE
BLEACHING POWDER
CAUSTIC SODA
Solid and Flaked

We solicit your inquiry for prompt or future delivery

Starch

—and these stars have a meaning—

They signify the different grades in which Thin Boiling Eagle Starch is offered to the textile industry.
Being the pioneers in the manufacture of **Thin Boiling Starches** we are gratified at the widespread recognition they have received.
Be sure to select the best grade suited to your work. Our knowledge and experience are at your service.

Corn Products Refining Co.

New York

Southern Office *Greenville, S. C.*

Starch

ciba Co. Inc.
BOSTON BRANCHES PROVIDENCE
PHILADELPHIA
COLUMBUS, GA.
CEDAR and WASHINGTON STS.
NEW YORK

Rosanthrene Fast Colors

are especially recommended for weaving yarns, embroidery yarns, etc., where **fastness to light and washing** are essential.

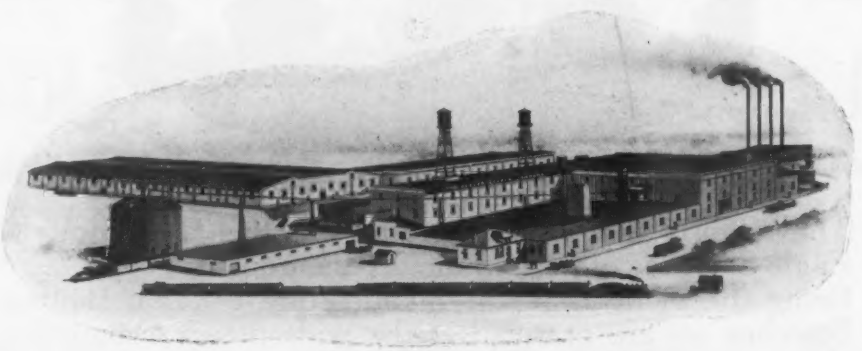
Their excellent solubility renders them suitable for machine dyeing.

They are not sensitive to copper.

Particularly suitable for silk and cotton unions in which both fibres are dyed alike.

Sole Representative in the United States for the
SOCIETY OF CHEMICAL INDUSTRY
in
Basle, Switzerland.

Sole Selling Agents for Dow's Indigo and Midland Vat Blues.



VICTOR MILL STARCH

The Weaver's Friend

It boils thin—it penetrates the warps—increases breaking strength and carries the weight into the cloth. Being thoroughly washed free of gluten and other foreign matter it gives a bleach and finish to the goods that you can get from no other starch.

A trial order will convince you that VICTOR STARCH has no equal on the market.

THE KEEVER STARCH COMPANY, Columbus, Ohio

Southern Agent: MR. JAMES H. MAXWELL, Greenville, S. C.

If you are not already using VICTOR STARCH call on our representative for a demonstration at your convenience.

Beam Bleaching and Dyeing

(*Brandwood's Patents*)

THE cheapest and *most satisfactory system* of Bleaching and Dyeing Warp Yarns for mass production. The cost per pound of yarn bleached or dyed *guaranteed less* than by any other system. In addition to the *Beaming Costs being saved altogether* and other important indirect savings, the bleach and dyehouse labor costs need not exceed *twenty cents per 100 pounds of yarn bleached or dyed.* Up to Nine Beams may be bleached or dyed at *one operation.*

Indigo, Hydron, Indanthrene, and Sulphur Colors are all being satisfactorily dyed in mass production by the system.

The cost of bleaching on the Beam by our Patented Processes for both materials and labor is guaranteed less than any other method or system; in addition to which all Beaming Costs are saved.

There is a greater production from the loom from our bleached and dyed Beams than by any other System.

The saving in Beaming and Dyehouse Labor costs alone are sufficient to pay off the cost of the Plant in the first year's working.

Exclusive Patent Rights have already been granted in many States and Territories in the United States, and the Plants now at work are capable of bleaching and dyeing over one million pounds weekly. Colored Manufacturers desirous of acquiring the "Rights" for their own State or territory should apply to:

Continuous Raw Stock Dyeing

(*Brandwood's Patents*)

DYEING continuously up to 2,000 pounds per hour in one Apparatus, VAT, SULPHUR AND DIRECT COLORS.

No shortening, weakening or *matting* of the staple.

Colored Spinning production equal to Grey Spinning.

Colors are brighter and more lustrous than when dyed by any other method. *Dyeing perfectly fast and even,* and at *less cost* in *dyestuffs.*

No *whizzing* or *hydro-extracting.* *Labor costs of Dyeing and Drying need not exceed ten cents* per 100 pounds of Raw stock *dyed and dried.*

On a basis of half a million bales of Raw Stock dyed annually in the United States, colored goods could be cheapened to consumers over twenty million dollars per annum if this wonderful New Process was generally adopted.

Exclusive Patent Rights are now being granted to Colored Goods manufacturers for their own State or Territory.

For full particulars apply to

JOHN BRANDWOOD

ELTON COP DYEING CO., LTD.

BURY, ENGLAND

"DEVELOPENE"

Leaves No Argument as to When

"BLACK IS BLACK"

WHY BE SATISFIED

with a RUSTY BLACK when you can have a RICH LUSTROUS BLACK by finishing your Hosiery with the latest, most efficient and satisfying patented preparation

"DEVELOPENE"

A Demonstration Will Convince You

Send us a pair of unfinished stockings, skein of yarn or a piece of fabric—cotton, silk, artificial silk, wool or mixes—which has been dyed black, washed, but not finished. We will finish it with "DEVELOPENE" and return to you.

There will be such an improvement that you will immediately want "DEVELOPENE" for finishing your goods.

No further softener—or soap—required. Makes hosiery slip on and off the board easily—leaves the product soft and pliable.

Kali Manufacturing Company

Manufacturing Chemists

1404-10 No. Front St. Philadelphia, Pa.

Sole Manufacturers of

Hydroxy Oil and Kali Chlorine Neutralizer

Sold or Stored

The little niceties in feel, in quality, in color which follow the use of

Wyandotte Textile Soda
Wyandotte Concentrated Ash
Wyandotte Kier Boiling Special

are just the added differences which cause your products to be preferred while others are passed. It costs no more to use these than Wyandotte Textile alkalies.

Write us or order from your supply man.

The J. B. FORD CO., Sole Mnfrs.

WYANDOTTE, MICH.

JACQUES WOLF & CO.

Manufacturing Chemists and Importers

PASSAIC, N. J.

ALL FINISHING and SIZING PRODUCTS for COTTON

ANTISTAIN

MONOPOLE OIL
Reg. Trade Mark No. 70991

BLEACHING OIL
Kier boil Assistant

HYDROSULPHITE
For stripping and discharge printing

CREAM SOFTENERS

ALIZARINE ASSISTANTS

Staley's

There is a Staley Starch to meet every need of the textile industry. In those infrequent instances where the complete Staley line does not meet some special requirement, our unsurpassed laboratory facilities and technical staff are at your service.

A. E. STALEY MFG. CO.
DECATUR, ILL.

Southeastern Office
A. E. Staley Mfg. Co.,
508 Andrews Law Bldg.,
Spartanburg, S. C.
Mr. George A. Dean, Mgr.

Southern Representative
J. W. Pope, care Ansley Hotel,
Atlanta, Ga.

New England Office
88 Broad St., Boston, Mass.
A. E. Staley Mfg. Co.,
Mr. L. B. Dickinson, Mgr.

New York Office
A. E. Staley Mfg. Co.,
311 Havemeyer Bldg.
25 Church St., New York, N. Y.
Mr W.. H. Randolph, Jr., Mgr.

Starch

"BRETON" MINEROL "F"

For
Cotton Yarns
"It develops fully the color."

BORNE, SCRYMSER CO.
Established 1874
80 South Street, NEW YORK
BOSTON **PHILADELPHIA**
Works: Elizabethport, N. J.

SONNEBORN PRODUCTS

"Well Dressed Is Half Woven"

A warp properly dressed with AMALOL AND GLUANTINE saves loss in the weave room.

Everywhere these modern sizing products are used. From $500 to $3000 is annually saved —depending on slasher equipment and loom capacity.

Many customers' letters prove the point.

A New England mill manufacturing sheetings writes:

> "We have very good results with your sizing preparations. They perfect the penetrating qualities of the size and reduce the dusting off in the weaving remarkably. The yarn sized with your preparations remains pliable and does not get brittle and rough. They also make a saving in the cost of the size and in slasher cloth wearing much longer than with any other sizing we ever used, proving that they are free of corrosive chemicals."

Profit by the experience of others. Test Amalol and Gluantine. 90% of our customers were satisfied with old methods until they tried our products.

Order a barrel of Amalol and Gluantine on approval—satisfaction guaranteed! Our cotton mill specialist will personally conduct practical test without obligation.

L. SONNEBORN SONS, INC.

Textile Products Division

116 Fifth Ave. **New York City**

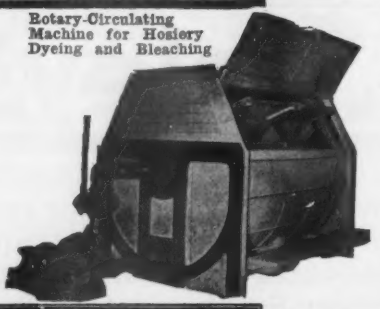
W. D. INGLE, Southern Representative, Charlotte, N. C.
DUCKWORTH & KENDRICK, Selling Agents, Greenville, S. C.

SONNEBORN

"HURRICANE" DYEING, DRYING AND FINISHING MACHINERY, PRESSES, ETC.

The Best for Developed and Direct Black Dyeing on Hosiery

"HURRICANE" Rotary-Circulating Machines have no equal for developed or direct black dyeing. On developed black work the goods are entered dry, without dye nets. Dyeing, diazotizing, developing and finishing are all done in sequence without removal from the machine.
Uniform work is produced, with a minimum consumption of dyes, chemicals, steam and water. There is no rolling or tangling of the goods, and the quality of the finest hose is fully maintained.
Loading and unloading is surprisingly quick and easy.
Units are built to handle 200, 400, 600 or 1,000 pounds per dyeing.
One man can take care of two machines.


Rotary-Circulating Machine for Hosiery Dyeing and Bleaching

THE PHILADELPHIA DRYING MACHINERY CO.
MAIN OFFICE AND WORKS: STOKLEY ST., ABOVE WESTMORELAND, PHILADELPHIA, PA.

Cypress Tanks
Wooden Packing Cases
ALL STYLES

Manufactured from
GEORGIA PINE POPLAR CYPRESS
WHITE PINE and GUM
Your Inquiry Solicited

Hightower Box & Tank Co.
Corner Humphreys and Glenn Streets
BOX 1025 ATLANTA, GA.

Highest Quality
Roller, Clearer and Slasher Cloths

Let us supply your requirements for the very highest attainable quality in Roller, Clearer and Slasher Cloths.

Our roller Cloths are made of the right material with exactly the correct cushion and uniformity of surface to produce the most desirable results.

Clearer Cloth is constructed of high grade material with thick, strong nap that does not pull out and its uniform length is such that the rolls are completely cleared of all short fibre.

Our Slasher Cloth is made of the best material of sufficient cushion and porous to thoroughly force the sizing into the yarn.

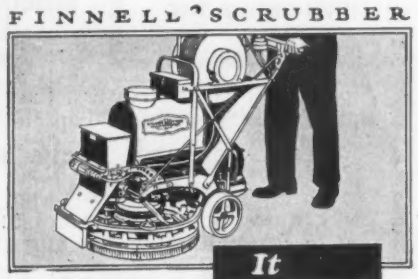
Let us send trial order or write us for prices.

PHILADELPHIA FELT COMPANY
FRANKFORD, PHILADELPHIA, PA.
Southern Sales Agent: M. C. Sanders, Greenville, S. C.

Save Money

IN YOUR MILL!

FINNELL SCRUBBER



It SCRUBS *Electrically!*

Use the

FINNELL SYSTEM

of Power Scrubbing

and show a profit in your Mill on what is now non-productive labor. Over 300 other mills are showing a profit by using this System. It can save money and make money for **you.** You can have cleaner floors at one-half the cost.

It gets the dirt out of the mill and keeps it out. It gets the oil out of the boards and keeps it out. It maintains the natural white color of the boards continuously.

Do you want CLEAN FLOORS at less cost?

WRITE US NOW.

AMERICAN SCRUBBING EQUIPMENT CO.

General Offices and Factories:
1229 N. Collier St., Hannibal, Mo.

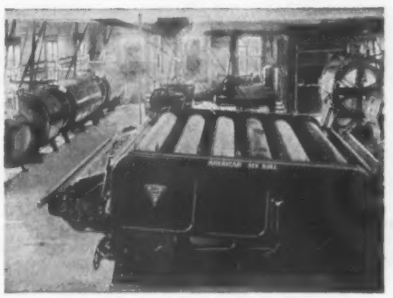
DISTRICT OFFICES

ATLANTA	CLEVELAND	MINNEAPOLIS	PHILADELPHIA
BALTIMORE	DENVER	NEWARK	PITTSBURGH
BOSTON	DETROIT	NEW ORLEANS	ST. LOUIS
CHICAGO	LOS ANGELES	NEW YORK	SAN FRANCISCO

"Clean Floors Reflect Clean Business"

Are your floors
CLEAN?

THE AMERICAN MILL VILLAGE LAUNDRY



A general view of a typical American Mill Village Laundry installed by The American Laundry Machinery Company.

Happy, willing operators produce more per man per hour. Secure this advantage for your mill and added profit for yourself by putting an American Mill Village Laundry to work for your employees.

The American Laundry Machinery Company

Specialty Dept. C.
Cincinnati, O.

Canadian Office
The Canadian Laundry Machinery Co., Ltd.,
47-49 Sterling Road,, Toronto, Ontario, Can.

Representatives in Great Britain
American Laundry Machinery Co., Ltd.
36-38 Victoria St., London, S. W.-1, England

The American Laundry Machinery Company,
Specialty Department C,
Cincinnati, Ohio.

Gentlemen: Send me the complete details about American Mill Village Laundries for Textile M.I.s. It is understood this involves no obligation to myself.

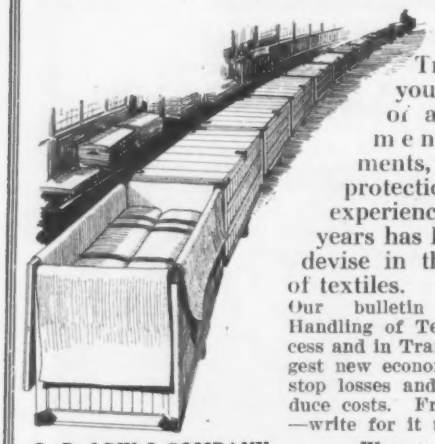
Name .....

Firm ..... State .....

City .....

Send the Coupon for full information

Exactly Suited For Handling Thread, Yarn and Goods



Lewis Box Trucks offer you the total of all improvements, refinements, savings and protections that the experience of many years has been able to devise in the handling of textiles.

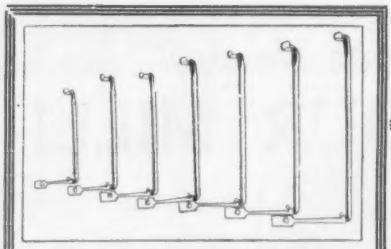
Our bulletin "Economical Handling of Textiles in Process and in Transit" may suggest new economies that will stop losses and help you reduce costs. Free on request —write for it today.

G. B. LEWIS COMPANY, Watertown, Wisconsin

BOX TRUCK DIVISION C-13

John Cronin, 13 Hamilton St., Boston, Mass.; Mill Specialties Co., 439 Arch St., Philadelphia, Pa.; W. Gracey Co., 230 Broad St., Spring City, Pa.; E. C. Buehrer Co., 18 Front St., San Francisco, Cal.; J. D. Collins Sales & Engineering Co. 55½ Luckie St., Atlanta, Ga.; R. E. Stanton Equipment Co., 615 Ryan Annex, St. Paul, Minn.; R. R. Street & Co., 28 N. Clinton St., Chicago, Ill.; Edw. L. Koehnig Co., 23 W. Kinzie St., Chicago, Ill.—Detroit address—Ryerson Bldg.—Milwaukee address—114 Grand Ave.—Alvin Lovingood Co., 14 Walker St., Atlanta, Ga.

LEWIS Box Trucks



SOLD THROUGHOUT THE WORLD

We MANUFACTURE

Steel Rolls, Flyer Pressers, Card Room Spindles, Lifting Rods, Top Rolls, Etc.

We Overhaul, Move and Re-arrange

Fly Frames, Spinning Frames, Twisters and Spoolers.

Expert Repairers of

Steel Rolls and Spindles and Flyers of All Makes.

We Sell

Twisters, Single and Double Spinning Rings of the Best Make.

SOUTHERN SPINDLE & FLYER CO., Inc.

CHARLOTTE, N. C.

Manufacturers, Overhaulers and Repairers of Cotton Mill Machinery

W. H. MONTY, Pres. & Treas. W. H. HUTCHINS, V.-Pres. and Sec.

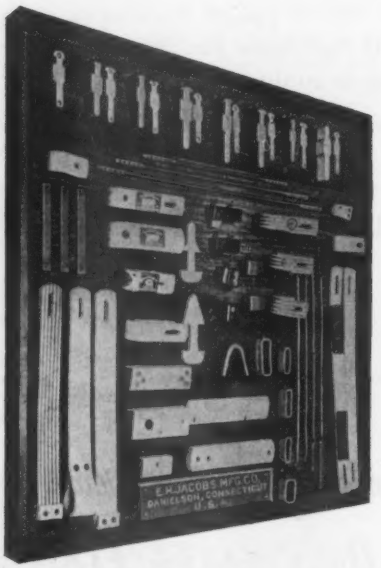
SAVOGRAN

Cleans Floors Thoroughly and Economically

Sent on Trial

INDIA ALKALI WORKS

BOSTON, MASS.



The "E Pluribus Unum" of Business

No sale or business transaction can take place without a "meeting of minds." Whether a block or a thousand miles separate buyer and seller, their minds must meet before goods can be sold or bought.

In the old days trading at a distance was slow and cumbersome; the standards of merchandise, demand and price varied widely every hundred miles. Big, economical production was impossible. The world moved with a slow and halting pace.

The contrast between that period and today demonstrates that *civilization can advance only in proportion to our ability to disseminate thought and transport things.*

This principle is the foundation of our national unity. The United States is not merely a physical union, but a union of hearts and minds created by common ideals, uniformity of education, common habits, thoughts and purposes.

This is made possible largely by unifying influences not possessed by the ancients—by our great pulsating *highways of intelligence*—the daily, weekly and monthly publications.

No more than three or four of the readers of this paper may be in a single town, and the others similarly scattered over the country but all read the same news, get the same ideas, learn of the same goods, and thus the group is integrated and bound together by a common source of information.

By establishing these great inforrmation routes between the members of the various trade and industrial groups, the Business Paper makes one market of the whole country for the seller, and gives to the buyer a nation-wide source of supply.

LIST OF MEMBERS

Each has subscribed to and is maintaining the highest standards of practice in its editorial and advertising service

Advertising and Selling
American Architect & Architectural Review
American Blacksmith, Auto & Tractor Shop
American Exporter
American Funeral Director
American Hatter
American Machinist
American Paint Journal
American Paint & Oil Dealer
American Printer
American School Board Journal
Architectural Record
Automobile Dealer and Repairer
Automobile Journal
Automotive Industries
Bakers Helper
Bakers Weekly
Boiler Maker (The)
Boot and Shoe Recorder
Brick and Clay Record
Buildings and Building Management
Building Supply News
Bulletin of Pharmacy
Canadian Grocer
Canadian Machinery & Manufacturing News
Canadian Railway & Marine World.
Candy and Ice Cream
Chemical and Metallurgical Engineering
Clothier and Furnisher
Coal Age
Coal Trade Journal
Concrete
COTTON
Daily Metal Trade
Distribution and Warehousing
Domestic Engineering
Dry Goods Economist
Drygoodsman
Dry Goods Reporter
Electric Railway Journal
Electrical Merchandising
Electrical Review and Industrial Engineer
Electrical Record
Electrical World
Embalmers' Monthly
Engineering and Contracting
Engineering and Mining Journal
Engineering News-Record
Factory
Farm Implement News
Farm Machinery—Farm Power
Fire and Water Engineering
Foundry (The)
Furniture Journal
Furniture Manufacturer and Artisan
Furniture Merchants' Trade Journal
Garment Weekly (The)
Gas Age-Record
Good Furniture Magazine
Grand Rapids Furniture Record
Haberdasher (The)
Hardware Age
Hardware & Metal
Heating and Ventilating Magazine
Hide and Leather
Hospital Management
Hotel Monthly
Hotel Review
Illustrated Milliner
Implement and Tractor Age
Implement and Tractor Trade Journal
Industrial Arts Magazine
Inland Printer
Iron Age
Iron Trade Review
Lumber
Lumber Trade Journal
Lumber World Review
Manufacturers' Record
Manufacturing Jeweler
Marine Engineering & Shipping Age
Marine Review
Millinery Trade Review
Mill Supplies
Modern Hospital (The)
Motor Age
Motorcycle and Bicycle Illustrated
Motor Truck
Motor World
National Builder
National Cleaner & Dyer
National Laundry Journal
National Lumber Merchant
National Petroleum News
Nautical Gazette
Northwest Commercial Bulletin
Northwestern Druggist
Oil News
Oil Trade Journal
Power
Power Boating
Power Farming Dealer
Power Plant Engineering
Price Current—Grain Reporter
Printer's Ink
Purchasing Agent
Railway Age
Railway Electrical Engineer
Railway Maintenance Engineer
Railway Mechanical Engineer
Railway Signal Engineer
Retail Lumberman
Rock Products
Rubber Age
Sanitary & Heating Engineering
Shoe Findings
Shoe and Leather Reporter
Shoe Retailer
SOUTHERN ENGINEER
SOUTHERN HARDWARE & IMPLEMENT JOURNAL
Sporting Goods Dealer
Starchroom Laundry Journal
Tea and Coffee Trade Journal
Textile World
Welding Engineer
Wood-Worker (The)

THE ASSOCIATED BUSINESS PAPERS, Inc.

JESSE H. NEAL, Executive Secretary

HEADQUARTERS: 220 WEST 42nd STREET NEW YORK CITY

The Equivalent of Sea Breezes

CLEAN, invigorating, dust free air containing the proper proportion of moisture is essential to bodily comfort.

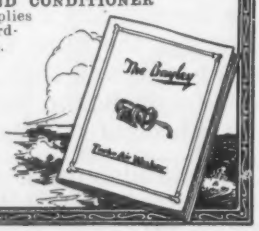
You can have equivalent of sea breezes,

Right in Your Office

and factory, with temperature and humidity under perfect control after you install a

TURBO AIR WASHER AND CONDITIONER

This wonderfully efficient unit supplies a steady volume of pure air regardless of atmospheric conditions, and keeps temperatures and humidity practically uniform, whether outside temperatures are 40 below or 100 in the shade.

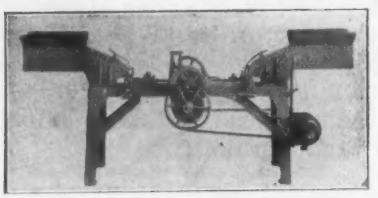


Write for free book today.

BAYLEY MFG. CO., Dept. I

Milwaukee, Wis.

When Planning Ways of Reducing Expenses Remember This



"UTSMAN" QUILL CLEANING MACHINE

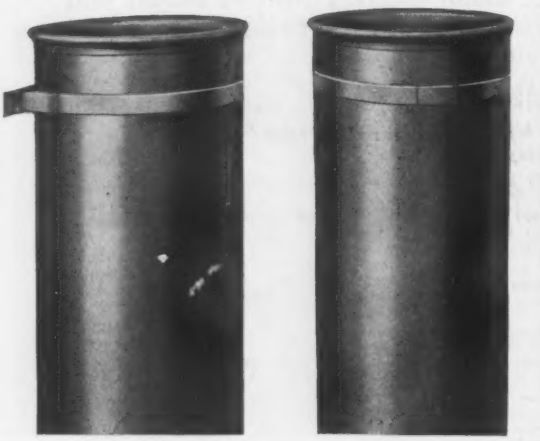
will pay for itself in a very few months by reducing the cost of labor.

This is not a claim made for advertising purposes. It is based on results actually obtained in over 300 installations.

WRITE OUR SERVICE DEPARTMENT FOR DETAILS.

The Terrell Machine Company, Inc.

CHARLOTTE, N. C.



SAFETY FIRST

O-C Patented Roving Can Indicators provide the best, simplest and most efficient method of avoiding mixed work in the Carding Department. By eliminating painting and the tying of strings, they remove the unsightly conditions which generally result when trying to avoid mixed work. They eliminate the need for an extra supply of cans, thereby allowing all cans to be in use at the same time, avoiding delay.

A trial order will convince you. Sample sent and prices quoted on application.

O'MALLEY & CARROLL

Manufacturers of

Roving Can Indicators

UTICA NEW YORK

AMERICAN SUPPLY COMPANY

PROVIDENCE, R. I.

MANUFACTURERS OF

Loom Harness,
Weaving Reeds,
Oak Tanned Leather
Belting, Strapping,
Etc.

We make a specialty of Harness for Warp Drawing Machines

NOTE—No orders too large for our capacity. None too small to receive careful attention.

THE BELGER CO., BOSTON, MASS.

FORMERLY J. WEINBRENNER & CO.

Roth's Pat. Improved
ASPIRATORS
and Roll Waste Packers
for ALL MAKES OF
COMBERS.

BETTER COMBED and
CLEANER SLIVER.

SAVINGS in
WAGES,
HALF LAPS
AND BRUSHES.

WASTE of same good quality as with old doffer arrangement.

Bristol Manufacturing Corporation
PLAIN, TWILL AND FANCY
COTTON GOODS.
New Bedford, Mass., June 9, 1922.
The Belger Company,
50 Bromfield Street,
Boston, Mass.
Gentlemen:
Our combers are now entirely equipped with your Aspirators and also with your Camless Detaching Device. We have been running them now for over two years, and are highly pleased with them, and are getting good results.
Yours very truly,
Bristol Mfg. Corp.
Supt.

PATENTED CAMLESS
DETACHING MOTION
for NASMITH Combers.

INCREASED
PRODUCTION.

with same good quality of combed sliver for which the Nasmith comber is so well known.

LESS POWER,

SIMPLIFIED
SETTINGS and
ADJUSTMENTS.

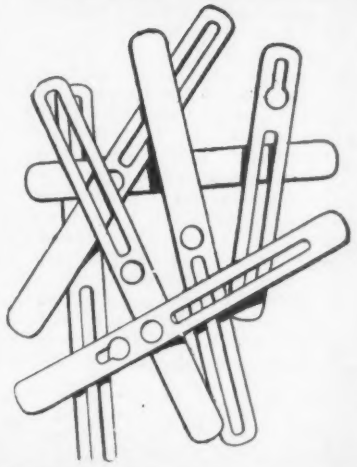
WASTE is drawn direct from brush to perforated cylinder.

WASTE delivered separately for each comber-head.

NOISELESS WORKING—
This mechanism replaces the big cam, the quadrant and pinion, clutch, clutch operating cam and lever of the present machine.

ALSO IMPORTERS OF TURKEY RED YARNS FAST TO BLEACHING

GREIST



Satin Finish Loom Drop Wires
are *Good Wires*

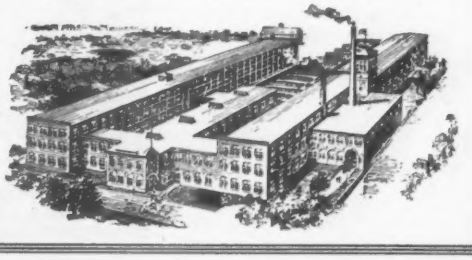
Uniformly made—free from burrs
a reliable source of supply.

The Greist Manufacturing Company, Dept. C., New Haven, Conn.

New England Representative:
Boyd's Textile Bureau
P. W. Boyd, Manager,
339 Butler Exchange,
Providence, R. I.

Southern Representative:
The G. G. Slaugter Machinery Company,
Greenville, S. C.

Fall River and New Bedford:
Coldwell Gildard Company
108 Hartwell St.,
Fall River, Mass.



VERMONT SPOOL & BOBBIN CO.

OF

BURLINGTON, VERMONT.

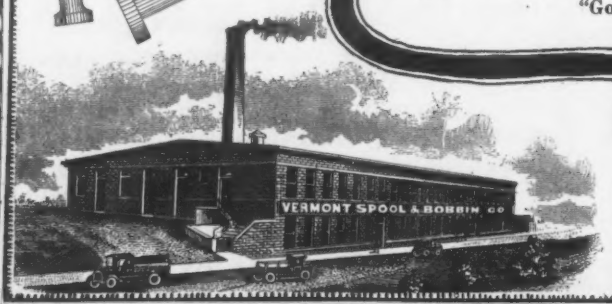
There are two prime requisites in the production of superior bobbins and spools—the plant and long experience. We have both.

Our plant is equipped with the most up-to-date and efficient machinery. From the selection of the wood to the finishing of the product the same care is exercised in every department—uniform bobbins and spools of the highest class being the result.

Our long experience in the design and manufacture of spools and bobbins for textile mills all over the country enables us to understand your requirements and give you 100% satisfaction.

Give us a trial order and you will remain one of our satisfied customers. Write for prices.

"Good Goods at Fair Prices."



SPINNING RING SPECIALISTS SINCE 1873

SPINNING RINGS
TWISTER RINGS
SILK RINGS

DIAMOND FINISH

TRAVELLER CLEANERS
TRAVELLER CUPS
GUIDE WIRE SETS

WHITINSVILLE SPINNING RING CO.

WHITINSVILLE, MASS.

BRUSH REPAIRING

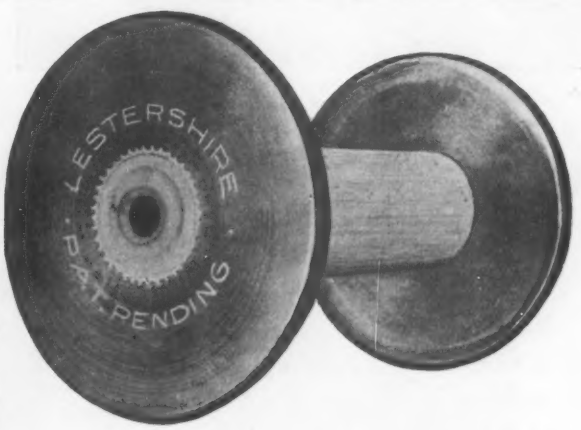
Repairing, renewing, refilling and restoring worn brushes is a service we render textile mills that reflects the excellence of our manufacturing product.

The facilities for repairing are just exactly as good and efficient as the manufacturing, and when card cylinders need refilling, or other brushes need restoring, you can send them to us with the certainty of getting the best repair work possible.

ATLANTA BRUSH COMPANY

Atlanta, Ga.

What Part of the Spool is First to Wear Out?



Your superintendent will confirm our statement that 99% of all Warper, Twister or Spooler Spools become useless on account of the heads breaking, wearing rough or loosening. This is true of all types of Spools heretofore on the market.

With the Lestershire Type Vulcanized Fibre Head Spools just the opposite is true. The Heads will outwear the barrels because Hard Vulcanized Fibre (the same material from which end thrust bearings and automobile gears are made) will never break, wear rough nor splinter.

Of course the first cost is higher but, figuring your charges per thousand spools per year, they are by far the most economical spools on the market today.

In addition Lestershire Fibre Head Spools will in the ordinary mill give you an increased unloading production of nearly 50%. Put a row on your creel and compare the time necessary to unload with any other type Spool.

On the smooth Rock Maple barrel, cleanly jointed to the Fibre Heads which cannot get rough and cannot be dented, there is no place for the yarn to catch.

Spindle wear is also eliminated by bushings of hard well seasoned Dogwood.

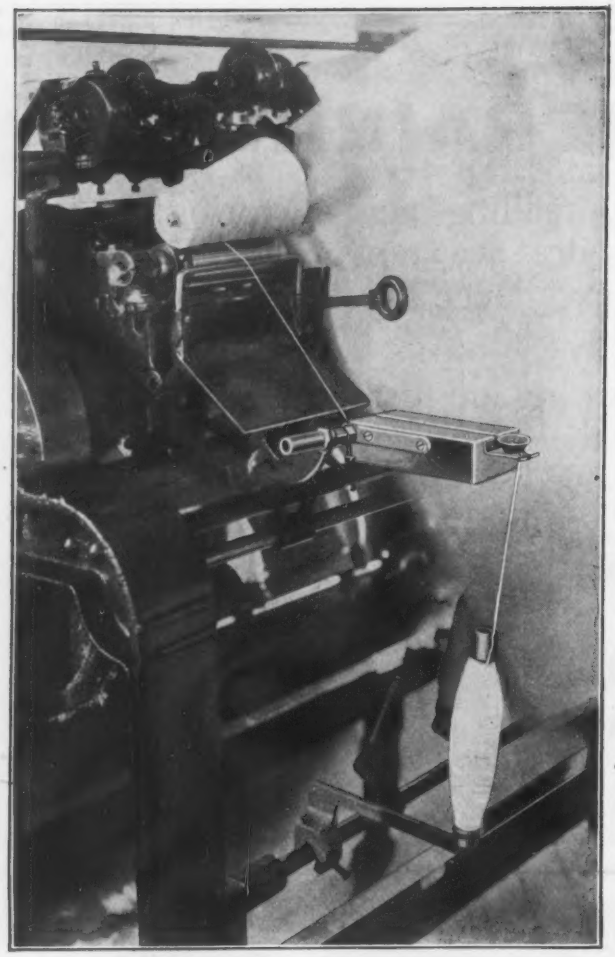
Increased traverse can be had which will give you greater yardage on your spools. This means a saving of many dollars in the course of a year. not only direct but in labor required to change the spools.

At your request we will gladly send samples for purposes of test and comparison.

LESTERSHIRE SPOOL & MFG. CO.

Manufacturers Mill Spools, and Bobbins, of Description

JOHNSON CITY, N. Y.



The Eclipse

AUTOMATIC YARN CLEANER

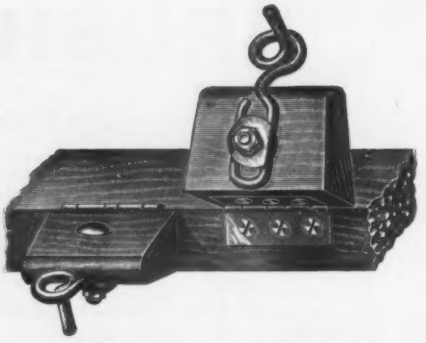
An entirely new principle is involved in that the yarn is cleaned by **flexible** blades which vibrate **constantly.** This device is small and compact and easily attached. The strength and elasticity of the yarn is not affected in the slightest.

ECLIPSE TEXTILE DEVICES, INC.

ELMIRA, N. Y.

Makers of
Automatic Yarn Cleaner
Automatic Stop Motion
Yarn Tension Device

The Palmer Adjustable Thread Guide



For Ring Spinning and Twisting Frames

Easily Adjusted.

Extreme accuracy and permanence of setting.

Cheapest of them all.

Mail guide-block for free sample.

Patented and manufactured by

THE I. E. PALMER COMPANY

Middletown, - - - Connecticut

THE

"Southwestern Iron Clad"

Is the IDEAL Cotton Mill Broom

Only the best grade of broom corn is used in these brooms—they are built strong and will withstand the hardest usage.

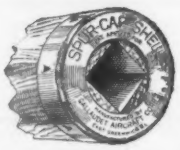
The light weight, yet strong and substantial shields used gives the broom ample protection and at the same time allows the proper amount of broom corn to be used, thus giving them excellent sweeping qualities.

MADE RIGHT!
PRICED RIGHT!

Inquiries and orders receive prompt attention.
Sold direct and through
all principal distributors.

The Southwestern Broom Mfg. Co.

Evansville, Indiana



Pat. Applied for

SPUR-CAP SHELLS

Made to Stand the Hard Knocks

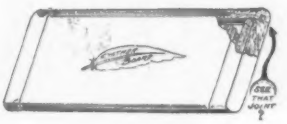
MANUFACTURED BY

GALLAUDET AIRCRAFT CORP'N.,

EAST GREENWICH, R. I.

FEATHERBOARD

The Master Cloth Reel

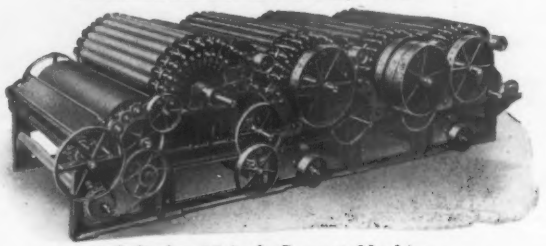


LIGHT AND STRONG. IMPROVES YOUR PUT UP.

SMITH & FURBUSH MACHINE CO.

PHILADELPHIA, PA.

A Garnett Machine of this size will reduce to fibre hard twisted thread waste without materially shortening the staple. We also build smaller machines for working soft washes.



4 Cylinder 30-inch Garnett Machine.

This Garnett is built on our own sectional unit frame construction and contains many improvements which we will be glad to explain.

Ask for Circular S-182.

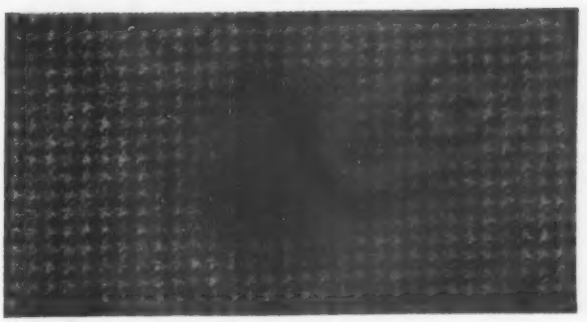
Stained Goods!

Hot Bearings mean short life.

Bearings are expensive.

Oil running out of bearings means dirty floors and machinery. RESULTS! WASTED MATERIAL FROM STAINED GOODS.

STAYSWELL laughs at drips and spatters.



STAINED GOODS ARE EASY TO AVOID BY USING THE SNOW-WHITE STAINLESS GRADES OF STAYSWELL

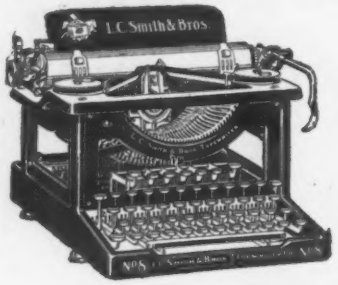
STAYSWELL "STAYS PUT" on the hottest bearing, eliminating all friction.

Let us quote you on your requirements.

Southern Distributer Wanted

LAMSON OIL CO., Inc.
10 Dorrance St. Wharf
PROVIDENCE, R. I.

Typewriter Friction Means Office Friction



Pounding on an inferior, noisy typewriter "gets on the nerves" of an operator.

One nervous, irritable, dissatisfied girl may disorganize the whole office force.

Executives can get better results by furnishing their typists with a ball bearing, silent running L. C. Smith.

There are many things about this machine that we would like to tell you if we may have the opportunity.

Our illustrated catalog is free.

L. C. Smith & Bros. Typewriter Co.

Home Office and Factory: SYRACUSE, N. Y.

Branches in all Principal Cities

Convenient for quick reference

Catalogs, price lists, rate books and other important reference papers are immediately at hand in the

Kleradesk

They are out of the way in their indexed compartments until wanted. It also sorts and routes mail, memos, orders, etc., for all to whom mail is distributed. Saves time. Efficient. Convenient.

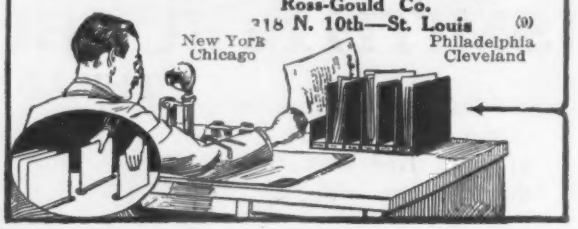
A Steel Sectional Device

Add compartments as required. Sections $1.20 each. Six-compartment Kleradesk illustrated below only $8.40. Indexed front and back. Write for free, instructive, illustrated folder, **"How to Get Greater Desk Efficiency."**

Ross-Gould Co.

218 N. 10th—St. Louis (9)

New York Chicago Philadelphia Cleveland



PRINTING

WE do it for some of the largest mills in the South—*Why not for yours?*

If our prices and service were not right, we could not do it.

THE A. J. SHOWALTER COMPANY

Dalton, Georgia.

ESTABLISHED 1887

BYRD PRINTING CO.

46-48-50 W. Alabama St. Byrd Building

Atlanta, Ga.

Offers experience, equipment and service to its patrons which are unexcelled by any printing plant in the country. Special forms for factories and mills solicited. Prompt deliveries, splendid service and perfect satisfaction in every detail guaranteed. A trial order will make you a regular customer.

Try Us Once!

Perfect Drinking Stream
AND
Automatic Stream Control

THESE 2 DOMINANT ADVANTAGES OF A DRINKING FOUNTAIN ARE DISTINCT HALSEY-TAYLOR FEATURES.

Note the convenient and Sanitary Drinking Mound

Built Along Scientific Lines.

Dependable

Sanitary

Manufacturers, schools and cities are installing Halsey-Taylor drinking fountains simply because the perfect drinking stream is the most sanitary—and because the automatic stream control regulates the water pressure, keeping the stream at a constant height at all times—never too high, never too low.

The perfect drinking stream is formed by two streams of water projected from the side of the fountain. Rising at an angle these two streams converge half way up, setting up a mechanical interference in the stream which retards the movement of the water at the apex of the arc, thus building a mound of water at the high point, from which drinking is convenient, easy and sanitary—no saliva or waste water to fall back to the source of the stream.

The automatic stream control, which gives an even constant pressure in the fountain regardless of the pressure in the water lines, is another distinct Halsey-Taylor feature—no other like it—positive acting without the disadvantages of other drinking fountains.

Whenever the relative merits of Halsey-Taylor drinking fountains have been compared point by point with others, Halsey-Taylor fountains are installed. Complete information will be sent promptly. Get it and make your own comparisons.

Halsey-Taylor Cooler Fountain

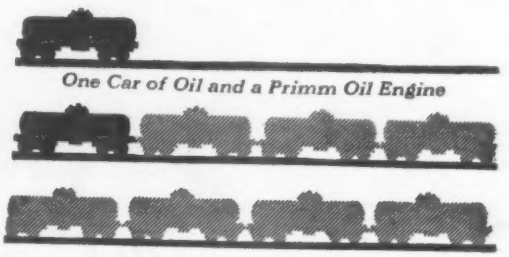
Puritan "Cantonment" Coolers are designed to connect to pressure lines and are so constructed that the drinking water does not come in direct contact with either the ice or ice water, but is circulated through brass coil which is tinned both inside and outside. With 2-stream "Mound Building" Projector this cooler is the most efficient and sanitary of its kind on the market.

The Halsey W. Taylor Company
538 No. Park Ave.
Warren, Ohio

Puritan CANTONMENT DRINKING FOUNTAINS

The Fountain with the Perfect Drinkirg Stream

Seven Cars of Wasted Fuel



One Car of Oil and a Primm Oil Engine

Eight Cars of Oil and a Boiler

ON a given amount of fuel, Primm Oil Engines produce eight to twelve times the power produced by the same amount of fuel under boilers.

This fact alone commends the Primm to users of power. Economy in power cost is a prime factor in reducing operation expense.

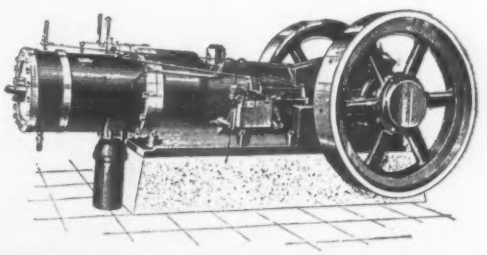
But in addition to fuel economy, Primm Oil Engines save labor, repair and fuel storage expense. *They pay for themselves out of what they save.*

For twenty years Primm Oil Engines have proved their superiority in every conceivable power field—from the rice field to their installation in industrial plants.

There is a Primm to meet every power need. Tell us your power problem, our engineers will solve it without cost to you.

Write today for descriptive bulletines.

The Power Manufacturing Co.
102 Cheney Avenue, Marion, Ohio



PRIMM OIL ENGINES

The Whitest of Whites
It Sticks and Stays

Zemco-lite
TRADE MARK

"The Cement Paint."

ZEMCO-LITE is the ideal mill white for your walls and ceilings. It will not collect dirt, will not flake off, and is a permanent white. Positively will not discolor. ZEMCO-LITE is not only a brilliant lasting paint, but it "sticks and stays" when applied. Can be easily washed.

Let us handle your painting problems, be they large or small, either for your mill, or for your mill village. We have a large variety of mill village paints, in colors that will meet your requirements. Let us quote you prices.

Send today for color card and price list of mill whites.

American Cement Paint Co.
Chattanooga, Tennessee

CONCRETE — DIXIE PORTLAND CEMENT CO. ROYAL CHATTANOOGA, TENN. — PERMANENT

MR. TAXPAYER—YOU!

Do you want your country to spend YOUR good money on roads that will wear out before your bonded indebtedness is liquidated?

I SAY YOU DON'T.

What you want is a hard-surfaced road, with little cost for maintenance—a road that can be traveled in rain or snow, summer and winter. You want a PERMANENT road—that means CONCRETE!

Write for Literature—It's Free

DIXIE PORTLAND CEMENT CO.
CHATTANOOGA, TENN.

VOGEL
PATENTED

Frost Proof Closets

350,000 giving satisfaction. Save Water; Require no Pit; Simple in the extreme. The most durable water closet made. In service winter and summer.

No. 1

- Enameled Roll flushing rim bowls.
- Heavy brass valves.
- Strong hardwood seat.
- Galvanized tank.
- Malleable seat castings will not break.
- Tested under hydraulic pressure before leaving factory.

ASK YOUR JOBBER

JOSEPH A. VOGEL CO.
WILMINGTON
DELAWARE

Village built by DuPont Powder Co.

These 2253 homes lined with Cornell Panels instead of lath and plaster

Cornell-Wall-Board is used in Mill Housing as well as factories, stores, offices and private homes, because it is the most economical material known for walls, ceilings and partitions that lies flat and *stays* flat and does not crack or fall.

Cornell's rigidity and resistance to moisture is due to the "Triple-Sizing" process which gives this wallboard triple the ordinary protection. Its "Oatmeal" finish is the handsomest effect in a wall board of any kind, and comes all primed for painting—"Mill-Trimmed."

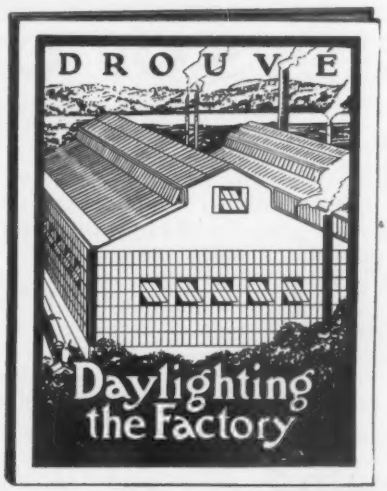
Cornell Wood Board

Eight lengths, 6 to 16 ft.—two widths—"Cornell 32', "Cornell" 48'

Special interior drawings, estimates and illustrated Book of Interiors on request. Write us.

CORNELL WOOD PRODUCTS CO., Dept. CO-7

General Offices, 190 N. State St., CHICAGO
Water Power, Mills and Timber Lands in Wisconsin.



Look Into It!

Perfect lighting of the mill interior is today, more than ever, an economic necessity, and of all lighting, natural daylight is the best and cheapest.

If you are contemplating changes in your mill, new additions or a new mill construction, look into the matter of skylights. This interesting booklet tells how skylight roofs can be made as substantial as any other roofs, how glass breakage has been eliminated and corrosion prevented, how better lighting and more perfect ventilation is assured, illustrating many installations, and containing other data of value to the mill man.

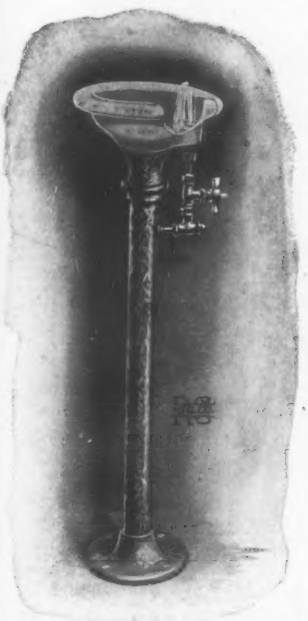
A copy should be in every mill man's file. Write for your free copy today.

THE G. DROUVE CO.

BRIDGEPORT, CONNECTICUT

"Vertico-Slant"

Stream Drinking Fountains



Have been perfected expressly to eliminate all dangers of contamination to the drinker regardless of how many persons may have visited the fountain before.

Practical construction has placed this fountain on a basis where it is easy to guarantee cleanliness thus making a unit of ideal construction.

In his general plan of efficiency the industrial buyer should include R-S equipment.

Lips cannot touch the driking nozzle.

Write for circular giving full details.

Rundle-Spence Mfg. Company

MILWAUKEE, WIS.

FIFTH SOUTHERN TEXTILE EXPOSITION

TEXTILE HALL

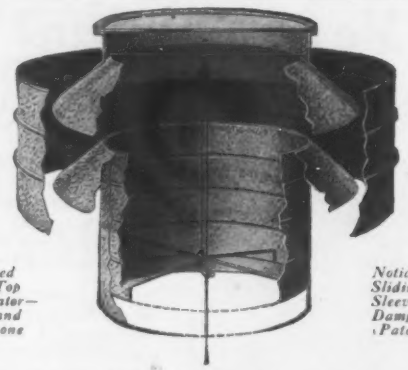
Greenville, South Carolina
October 19th to 25th Inclusive

The exposition will open at ten o'clock, Thursday morning, October 19th, will be closed Sunday, and re-open Monday. It will end Wednesday night, the 25th. Both main floors have been sold. A large attendance is expected.

Stairs will be built from each side of the stage up to the balcony where a few desirable spaces may be obtained.

A cordial invitation is extended to all persons interested in the textile trade.

TEXTILE HALL CORPORATION



Burt Patented Glass Top Ventilator—Light and Air in one

Notice Sliding Sleeve Damper (Patented)

Good "Live" Air
means
Good "Live" Men

Whenever the highest human efficiency must be maintained, you must have good "live" air and you will find that the best way to accomplish this essential condition is with BURT VENTILATORS.

When properly placed and installed BURT VENTILATORS cannot fail to make your plant an example of what good ventilation will do. The BURT principle is right and strength and durability are combined.

Submit your needs to us. We can meet them to your entire satisfaction.

Write for the BURT Book.

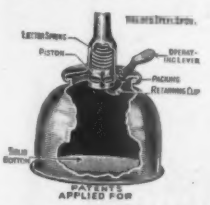
THE BURT MANUFACTURING CO., 244 HIGH ST., AKRON, OHIO

Also Manufacturers of the famous Burt Oil Filter and Exhaust head.

BURT VENTILATORS

DROPS OF OIL

LIDSEEN says, "place oil in the bearings. Not in quantities, but by the drop. Know that it is forced in."



Interior view showing simplicity in construction.

Showing wide opening for filling, also curved flanges and locking members which make it leak and wear proof at this connection.

The results from using a *Lidseen Textile Hand Oil* can are wonderful.

In mills where they are used, their troubles are over.

Sturdy construction
Welded spouts
Simple construction

This is truly the last word in an oiler to prevent spoilage of goods.

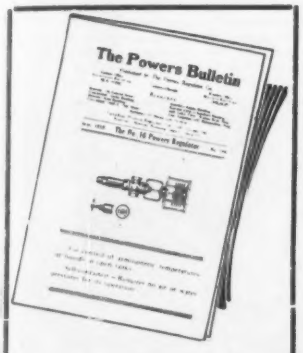
Ask your jobber or me.

LIDSEEN

832-840 S. Central Ave., Chicago

Prices — Costs — Wages — those are the words heard most frequently when business men get together.

Under present conditions, manufacturers must take advantage of every possible device and method that will *save* labor, or cut down other costs in any way.



Our Bulletins give concise, accurate information about Powers Regulators. Tell us what place or process needs heat control, and we'll send you the Bulletins that give pertinent facts, typical cases, etc. Free for the asking.

That's why so many are asking us about our methods of heat control—methods that save labor, coal, material, and time.

Wherever heat is used in a textile mill—even to warm the rooms—there is a certainty that a real saving can be effected by applying a Powers Regulator at the right point.

Powers Regulation is not a cure-all—not a generality—but it provides specific treatment for specific conditions.

Tell us where and how your processes are affected by irregular heat conditions, and we will tell you where and how Powers Regulation can effect improvements.

Heat Regulation has been our sole business for over thirty years. In that time we have solved many problems for manufacturers, and gained a rich fund of experience.

We are always glad to counsel with anyone who wants to know what Automatic Control will do for his business.

Please feel free to ask us questions.

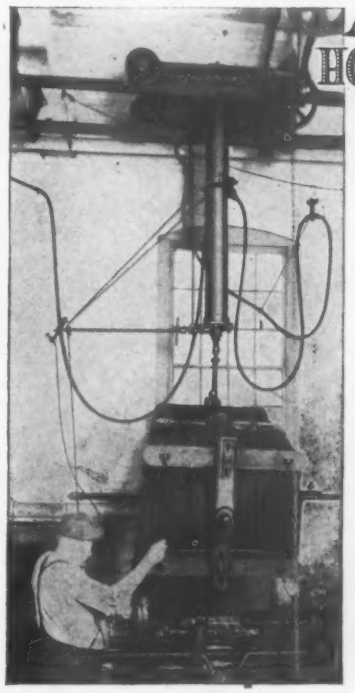
THE POWERS REGULATOR CO.
Specialists in Automatic Heat Control

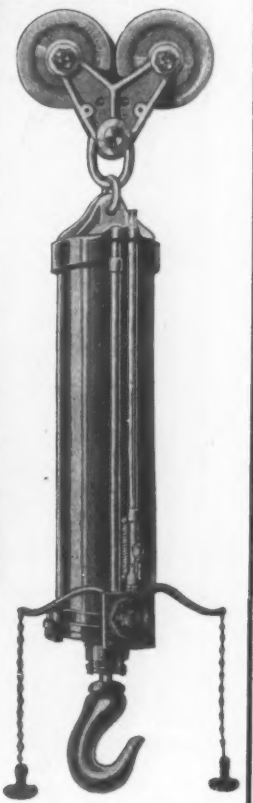
R—985—126 East 44th St., NEW YORK
2761 Greenview Ave., CHICAGO
596 Boston Wharf Building, BOSTON
The Canadian Powers Regulator Co., Ltd., Toronto

(1681D)

CURTIS

AIR HOISTS





Used in The Textile Industry

"Lift it with air"

Curtis one man All Steel Air Hoists and Curtis Roller Bearing Trolleys are effecting important economies in leading textile mills throughout the country.

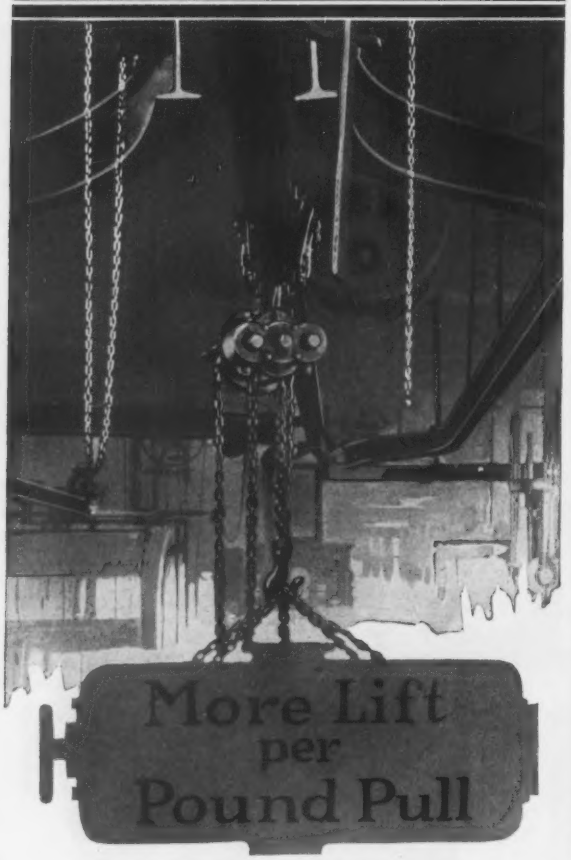
Why not install a Curtis Air Hoist and operate it with the air you now have available? The wide variety of uses to which Curtis equipment can be most economically applied is worthy of your immediate investigation.

Curtis Pneumatic Machinery Co.
1571 Kienlin Ave. St. Louis, Mo.
Branch Office
532-R Hudson Terminal New York

CURTIS
AIR COMPRESSORS-HOISTS-TROLLEYS-CRANES
ST. LOUIS
C.P.M'fg Co

Established 1854

CYCLONE HOISTS
HIGH SPEED



IN ease and speed of hoisting, Cyclones are unexcelled. The gyrating yoke, an exclusive hoist development which keeps two-thirds of all lift gear teeth always in mesh, plus roller bearings throughout, means smoother action, a faster lift and less muscular energy expended on the hand chain.

A Cyclone Hoist traveling upon a C. M. Track-system makes material-handling easier and speedier all through the plant.

We have capable distributors in all localities to aid you in laying out material-handling and hoisting systems and submit estimates. Catalog on request. *Write.*

The Chisholm-Moore Mfg. Co.
Cleveland, O.

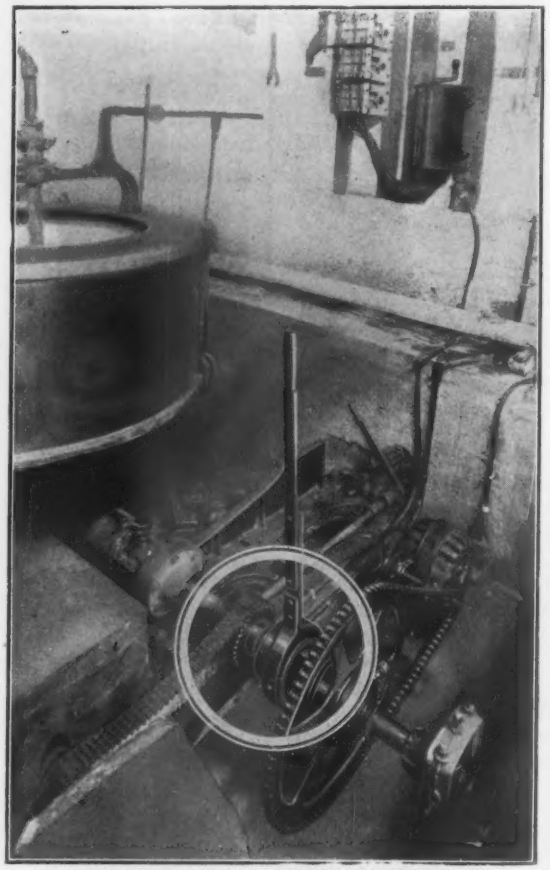
Hoists Cranes Trolleys

BRANCHES: **NEW YORK : CHICAGO : PITTSBURGH**

JOHNSON
FRICTION CLUTCHES
AS USED FOR YEARS TO DRIVE A

HIGH SPEED EXTRACTOR
BY LEHIGH SILK DYEING CO., ALLENTOWN, PA.

A peculiar situation faced the engineers of the Lehigh Silk Dyeing Co. After six o'clock their Whiz was the only machine to be operated. To keep the power on to operate the one machine was expensive. To install an independent motor to run this machine continually was expensive. THE JOHNSON FRICTION CLUTCH solved their problem, as it has solved many others. An independent motor was installed, a JOHNSON FRICTION CLUTCH (DOUBLE TYPE) was mounted on the driving shaft. On one Clutch hub was mounted a sprocket, to drive direct from their usual source of power, while on the other a sprocket was connected to the motor. The installation was a success. During regular working hours when the independent motor was idle, the clutch was engaged to drive from the regular power. After hours the independent motor was started. The Clutch disengaged from the regular drive, engages the auxiliary drive.



COURTESY LEHIGH SILK DYEING CO., ALLENTOWN, PA.

JOHNSON DOUBLE CLUTCH

JOHNSON FRICTION CLUTCHES pay for themselves by saving. They save you money, shutdowns and expenses.

Write for stocklist and Catalog "G."

The Carlyle Johnson Machine Co.
Manchester, Conn. U.S.A.

GUARANTEED RESULTS!

When using D-A LUBRICANT, you get positive results! Every wearing part will be perfectly covered and protected by an unbreakable film of oil that heat or friction will not destroy.

Why take chances of unreasonable wear from using cheap oils? Adopt D-A and get the service that only a high-grade, UNDILUTED Pennsylvania oil can give?

Distinctive advantages of D-A are—

Leaves No Gum Or Residue to Scrape Off
Does Not Thin Down or Melt from Heat
Stays On Cams, Gears, Chains and Rollers
Keeps Floors and Cloth Clean
Lasts Many Times Longer Than Ordinary Oils
Contains No Grease, Graphite or Acid
Is Not Affected By Moisture

D-A is guaranteed to be as represented or is returnable. Send us your order on this basis. Special gun for applying furnished with each order.

D-A LUBRICANT COMPANY

INDIANAPOLIS, INDIANA

DEPENDABLE-ALWAYS D-A Lubricant

Southern Representative:
John K. Gewinner,
33 Luckie St., Atlanta, Ga.
Northern Representative:
MacNichol-Crosby Co.
Boston, Mass.

Stronger and Cheaper than Leather

Fabreeka Belting

When strength and durability and efficiency are considered, "Fabreeka" Belting is unsurpassed by any other belt.

"Fabreeka" has no joints or weak places —cannot slip—does not stretch or shrink —runs smoothly and evenly. Its tensile strength is greater than leather—it is impervious to the destructive action of water, steam, weather, etc. The economy of "Fabreeka" is therefore obvious.

"Fabreeka" is the ideal belt for your mill requirements.

Let us quote prices.

Write for full particulars and prices.

Fabreeka Belting Company

30 India Street **Boston, Mass.**

Don't Stretch Your Warps on the Slashers !

Stretched, lifeless warps mean poor weaving and less production.

Ball-bearing-equipped truck rollers can be applied to your slashers in an hour without taking the yarn off.

The cylinders will then turn freely, and there will be no danger of stretching the warp.

The cost is very reasonable, and the bearings soon pay for themselves in better slashing.

AldricH MachinE

Ball WorkS Bearings

Greenwood, S. C.

CRESSON-MORRIS CO.

POWER TRANSMITTING MACHINERY

Merit Plus Recognition

"The heights by great men reached and kept were not attained by sudden flight."

Time, skill and effort must also precede merit as surely in machinery as in men.

Time, skill and effort must also precede merit in order to obtain and maintain for merit the recognition it deserves.

The great number of large installations of Cresson-Morris Power Transmitting Machinery is proof of both the merit and the recognition of the merit that nearly three score years of skill and effort hove endowed it with.

The cumulative knowledge of all this experience is always available to you in the recommendations of our engineers.

CRESSON-MORRIS COMPANY

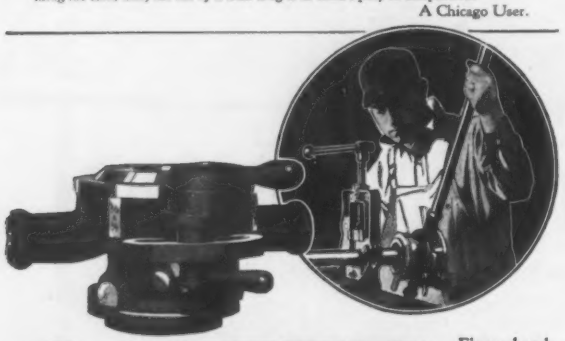
ENGINEE RS—FOUNDERS—MAHINISTS

PHILADELPHIA, PENNA

Branch Office. 141 Milk St., Boston, Mass.

30

"I have just finished an emergency job on which your No. 102 paid for itself. After using the solid dies, the use of a Bull-Dog is as child's play in comparison."
A Chicago User.



OSTER

BULL-DOG DIE-STOCKS

Eleven handy tools, plain and ratchet types, each threading 4 to 8 pipe-sizes. For example, No. 102 threads ¼, ⅜, ½, ¾, 1 and 1¼ inch pipe.

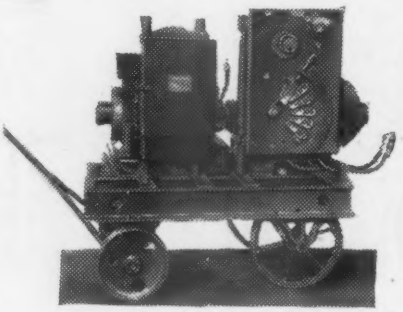
"the tool with the five big features" and the biggest is this—*the dies open up*. In other words, there is no laborious backing-off at the end of each cut which serves only to waste time and injure the clean edges of the freshly-cut thread. Write for descriptive booklet and name of near-by supply-house.

THE OSTER MFG. CO.

Specialists in Hand and Power Threading Equipment

2061 East 61st Place Cleveland, Ohio

"We think that our new tool paid for itself on one hot water heating job in our office in time saved and in perfect threads and tight joints.
A new owner in Ashtabula.



G-E Arc Welding Set

Speedy and Perfect

WELDING

are the results of using the G-E Arc Welding Set. When parts are welded with the G-E Arc Welding Set, they are made absolutely permanent.

We also carry a full stock of all oxy-acetylene supplies. Weldng torches, latest mproved—something new.

Highest Quality Equipment and our Efficient and Prompt Welding Service are at your command.

Write us for prices and full data.

George Bird Bruce Potts

WELDING ENGINEERS

BIRD-POTTS CO.

WELDING Incorporated BUILDING

376-378 MARIETTA ST., ATLANTA, GA.

Established 1854 *Incorporated 1898*

THE A. & F. BROWN CO.

ENGINEERS, FOUNDERS AND MACHINISTS

Engineering and Sales Office, 79 Barclay Street, New York

Works Elizabethport, N. J.

POWER TRANSMISSION SPECIALISTS

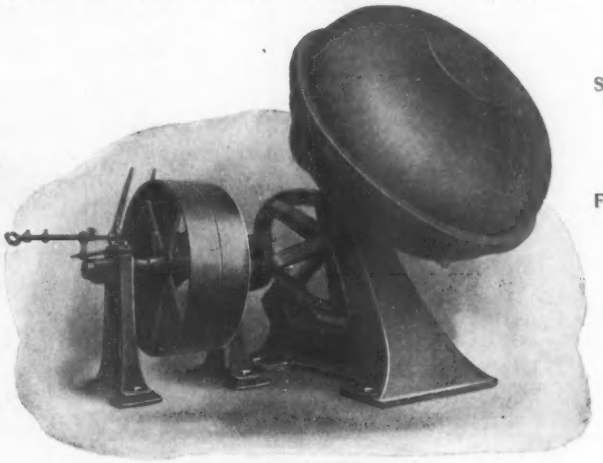
Stock Room in New York City

Economy is where quality determines the price, not where price controls the quality

GEARS
MACHINE MOULDED
3" TO 16 FT. DIA.

PLANED BEVEL
UP TO 48" DIA.

CUT SPUR
UP TO 96" DIA.



SHAFTING (Turned Steel)
PULLEYS
HANGERS
FRICTION CLUTCHES for
COUPLINGS,
PULLEYS,
GEARS,
SPROCKETS,
ETC.

Ball Color Mixer

Nine Sizes—18, 24, 30, 36, 42, 48, 54, 72, 96 inches.

For mixing and secondary grinding of Colors, Chemicals, etc.

BETTER **NON-FLUID OIL** LUBRICATION

Would You Accept Counterfeit Money?

No, of course not—then why accept a substitute lubricant? Mill men for years have known and proved the qualities of

TRADE MARK, REGISTERED IN **NON-FLUID OIL** UNITED STATES PATENT OFFICE

They Know

NON-FLUID OIL affords the positive lubrication of the best liquid oil but without the waste from dripping, spattering or creeping from bearings.

They Know

NON-FLUID OIL keeps in the bearing and off the cotton—not only saving valuable product from oil stains—but lasting longer per application—costing less per month for lubricant.

Genuine NON-FLUID oil has sprocket wheel trade mark on every container

Sample on request.

NEW YORK & NEW JERSEY LUBRICANT CO.

401 Broadway New York

Southern Agent, L. W. Thomason, Charlotte, N. C.
Ample Stocks at our Branches:
Charlotte, N. C.; Greenville, S. C.; Atlanta, Ga.; New Orleans, La.

AT LESS COST PER MONTH

STANDARD OXYGEN

STANDARD is the first company in the South to manufacture oxygen, and satisfaction is assured by prompt shipments, full measure and absolute purity.

When you use STANDARD Oxygen you are reducing your welding costs to the minimum, for STANDARD Oxygen is 99.5% pure—the best that can be bought.

There's a service station located near you.

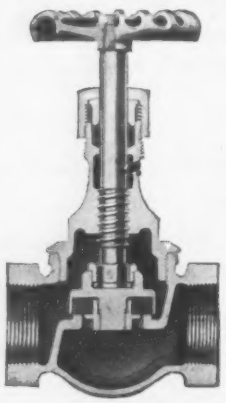
Write the one nearest you.

STANDARD GAS PRODUCTS CO., INC.

ATLANTA, CHATTANOOGA, GRETNA, LA.

REG. U.S. PAT. OFF.
TRADE JENKINS MARK
Jenkins Bros

For perfect valve performance



Superior service of Jenkins Valves is dependent on two component parts: the valve itself and its disc. The best or true Jenkins service can be expected only from genuine Jenkins "Diamond Marked" Valves, fitted with discs that bear the same distinguishing mark.

To make sure of perfect valve performance—first, use genuine Jenkins Valves; and second, when you renew a disc, use a genuine Jenkins disc.

Sectional view Fig. 106 Jenkins Standard Brass Globe valve fitted with Jenkins Renewable Disc.

At Supply Houses Everywhere.

JENKINS BROS.
New York Boston
Philadelphia Chicago
Montreal London

Jenkins Valves
SINCE 1864

2469-J

General Electric

Distributing Jobbers

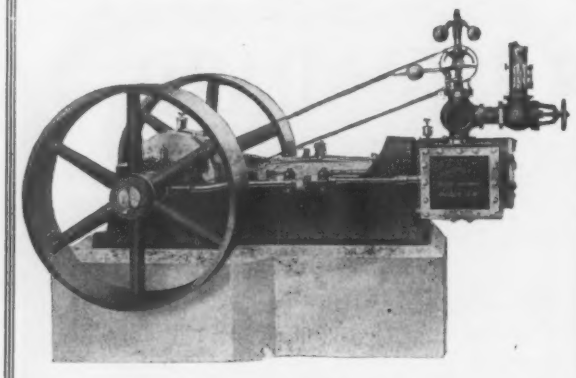
Complete lines of Wire, Switches, Safety Switches, Wiring Devices, Fuses, Edison Mazda Lamps and other electrical materials carried in our Atlanta and Savannah warehouses ready for immediate shipment.

Quick Service

Carter Electric Co.

(WHOLESALE)

21 Haynes St. Atlanta, Ga.



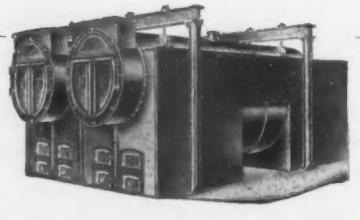
J. S. Schofield's Sons Co.

Macon, Georgia

MANUFACTURERS OF

High Pressure Return Tubular Boilers, High Grade Stationary Steam Engines, Tanks, Stacks, Stand Pipes.

Heavy Castings and Wrought Iron Works.



The Result of a Quarter Century Experience

These years of experience and study together with exhaustive tests and improvements, has enabled us to build modern boilers that are second to none—in design, construction, high efficiency and capacity, economical operation, and low cost for upkeep.

Made in several types. Write us today and let us send you full data and reasons why the W & W BOILER will best meet your requirements.

The Walsh & Weidner Boiler Co.

CHATTANOOGA, TENN.

WALSH & WEIDNER

TUBULAR WATER TUBE **BOILERS**

Price Reduction *Effective June 1st, 1922*

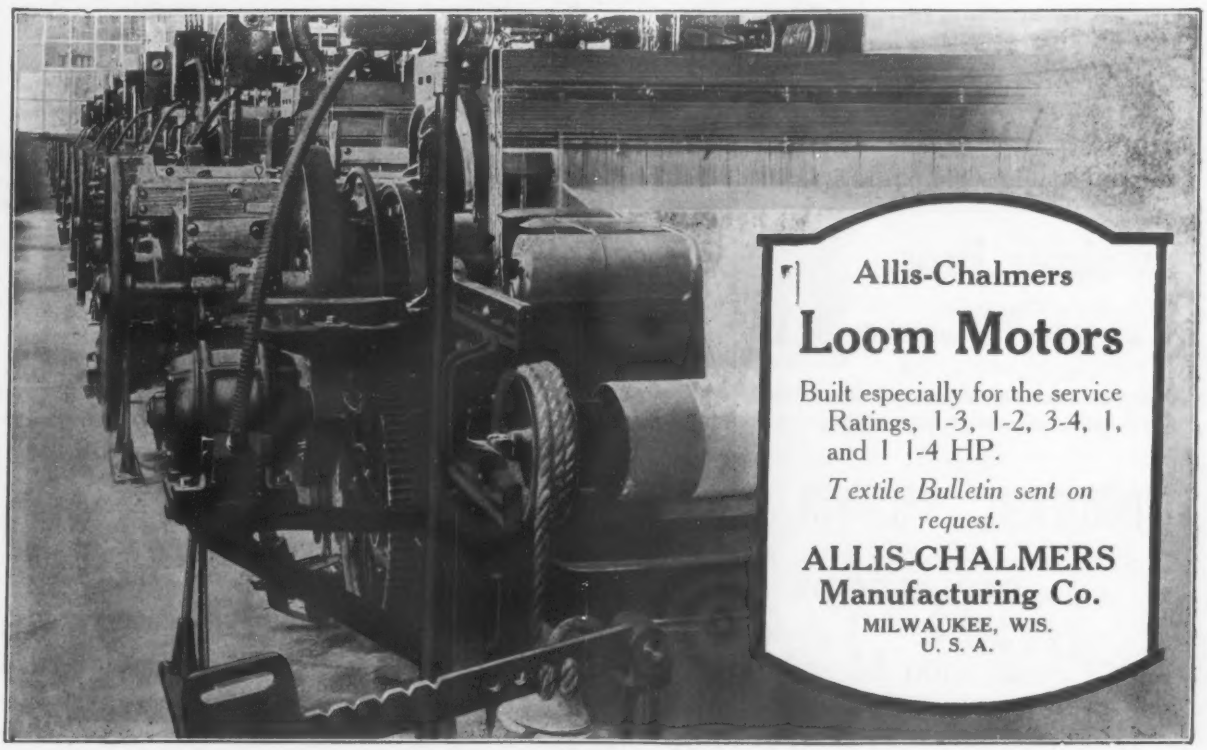
INCREASED production due to expanding business on Federal-National Multiphase, time limit powder packed renewable fuses has made it possible for us to offer you a further saving—this time in first cost—by reducing list prices June 1, 1922. Send us your specifications for detailed estimate—TODAY.

FEDERAL ELECTRIC COMPANY
8700 SOUTH STATE STREET
CHICAGO

91 New Montgomery Street
San Francisco, Calif.

130 West 42nd Street
New York City

BRANCHES IN ALL LARGE CITIES



Commission Merchants, Yarn Dealers, Cotton Dealers and Brokers, Banks, Etc.

The Recognized Standards of Quality
COTTON YARNS

Gray Manufacturing Co.
Arrow Mills, Inc.
Parkdale Mills, Inc.
Flint Manufacturing Co.
Arkray Mills, Inc.
Arlington Cotton Mills
Myrtle Mills, Inc.

Our Fine Yarns Make Fine Fabrics

The manufacturers of a number of America's well known textile products can vouch for the strength, uniformity, cleanliness and better weaving and knitting qualities of our yarns.

The yarns we spin for knitting, weaving, laces and converting, are furnished in all twists on skeins, cones, tubes and warps:

30s to 80s Single and Ply Combed Peeler Right Twist. 30's to 50's Single and Ply Double Carded Peeler, Right or Reverse Twist.

20s to 60s, 2, 3, and 4 Ply, Combed Peeler, Reverse Twist.

Our products are sold direct and exclusively through our General Sales Offices:
225 Fifth Avenue at 26th Street, New York.
H. A. FLORSHEIM, Sales Manager
Long Distance Phone: Madison Sq. 7666-7-8 and 9.
BRANCH OFFICES { Boston, Philadelphia, Chicago

GRAY DAWN QUALITY YARNS Gray Manufacturing Co. Gastonia, N.C.
ARROW MILLS COMBED YARNS GASTONIA, N.C.
MYRTLE MILLS INC. COTTON YARNS GASTONIA, N.C.
PARKDALE MILLS, Inc. PARKDALE YARNS ARE THE BEST GASTONIA, N.C.
ARLINGTON COTTON MILLS COTTON YARNS GASTONIA, N.C.
FLINT MFG. CO TRADE FLINT MARK GASTONIA, N.C.

Weimar Bros.

Phone Connections
Works, 2046-48 Amber Street,
PHILADELPHIA, PA.

MANUFACTURERS OF
Cotton Mercerized Tapes, Spool Tapes, Bindings and Narrow Fabrics for Underwear and other Trades.

WOODWARD, BALDWIN & CO.

DRY GOODS

Commission Merchants

43-45 WORTH STREET, NEW YORK

HUGHES FAWCETT

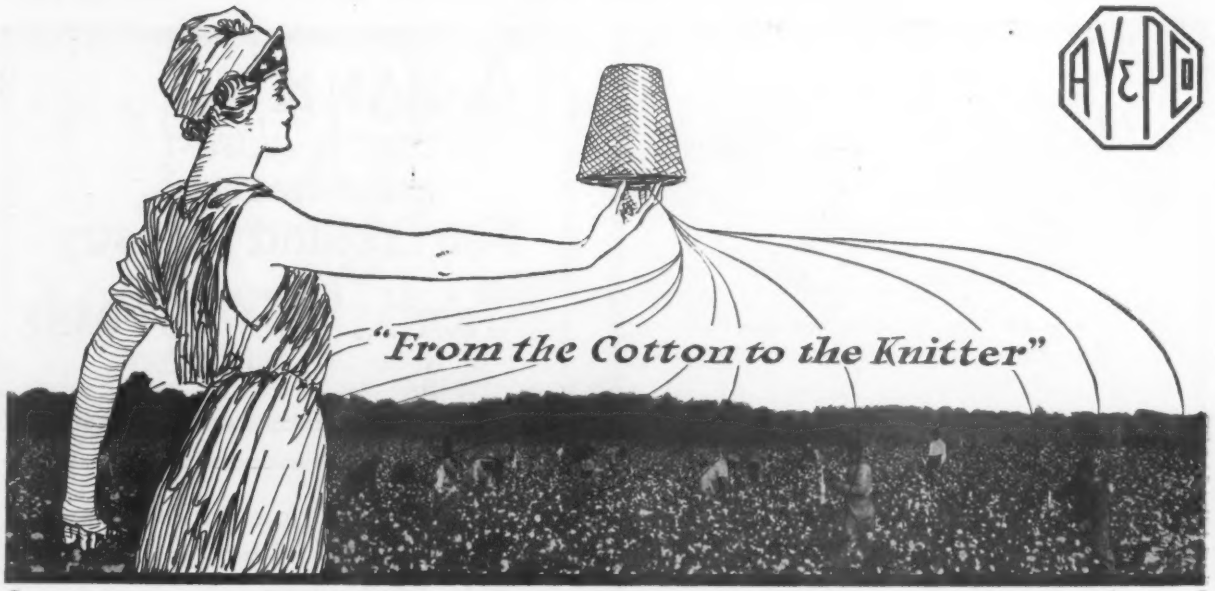
IMPORTER AND COMMISSION MERCHANT

LINEN YARNS
For Weaving, Knitting and all Purposes.

TURKEY RED YARNS
For Towel Borders, Towellings and Bleaching Cloth

Linen Jacquard Harness Twine
And Every Description of Linen Thread and Twine

115 Franklin Street, : NEW YORK



AY&PCo

AMERICAN YARN & PROCESSING CO.

MOUNT HOLLY, N. C.

SPINNERS AND MERCERIZERS

HIGH GRADE COMBED AND CARDED YARNS—16s to 80s

Our Mercerized Yarns Are the Product of Our Own Mills

General Office, Mt. Holly, N. C. **Branch Office, 1111 James Bldg., Chattanooga, Tenn.**

Representatives

H. B. ROBIE, 346 Broadway, New York City **FORREST BROS., Forrest Bldg., Philadelphia**

1865 The Oldest National Bank in the Cotton States 1922

The Atlanta National Bank

The Home Folks Know

APPROXIMATELY one person out of every nine in the city of Atlanta has an account at the Atlanta National Bank. We don't mean one business man out of every nine, but one out of every nine men, women, children, white and black.

If Atlanta National Service is good enough to make this showing among the people who come into constant contact with us, it will be equally good for those whose business with us is done through the mails.

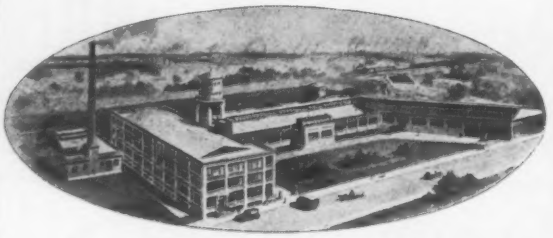
A very large number of banks have found the Atlanta National a highly satisfactory Atlanta connection.

The Atlanta National Bank

Capital and Surplus - $3,000,000

Active Designated Depositary

United States Government, State of Georgia, County of Fulton and City of Atlanta



View of our Mercerizing and Bleaching Plant

BOGER & CRAWFORD

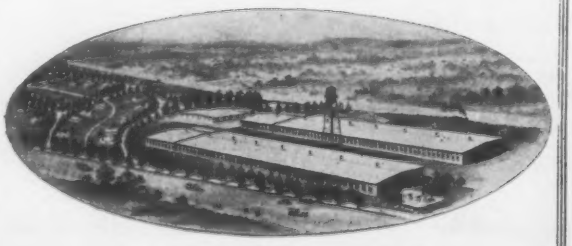
Established 1908

Spinners, Bleachers and Mercerizers of High Grade Combed Yarns

By using our Spinning and Mercerizing you are always assured of a standard product

"From the Cotton Field Direct to You"

Main Office, Factory and Warehouse
J and East Venango Sts., PHILADELPHIA



Spinning Mills, Lincolnton, N. C.

The **BANK** that is *closest* to the heart of New England Industry

The **NATIONAL SHAWMUT BANK** *of Boston*

THE next time you need an appraisal — get in touch with Jim Greene.

He knows appraisals, knows the cotton industry, and can show you the solution of your own valuation problems.

The American Appraisal Company
401 Healy Bldg., Atlanta, Ga.

The American Audit Co.

F. W. LAFRENTZ, C. P. A., Pres. — Telephone Ivy 869
H. M. RICE, C. P. A., Vice-Pres. — Cable Address
A. F. LAFRENTZ, Secy. & Treas. — Amdit, New York

NEW YORK—100 Broadway (Home Office).
33rd St. and 5th Ave., Waldorf-Astoria.
ATLANTA BRANCH—1013-1017 4th National Bank Bldg.
CHICAGO—Marquette Building.
BOSTON—P. O. Square Bldg.
PHILADELPHIA—Bellevue Court Bldg
BALTIMORE—Garrett Bldg.
WASHINGTON, D. C.—Colorado Bldg.
NEW ORLEANS—Maison Blanche.
RICHMOND, VA.—American National Bank Building.
LONDON, E. C.—50 Gresham St., Bank.
MILWAUKEE—Loan & Trust Bldg.
SCRANTON—County Bank Bldg.
WILKES BARRE, PA.
LOS ANGELES, CAL.

Specialties in Cost Systems and Manufacturing Accounts.

C. B. BIDWELL, P. A., Resident Vice-President

CARVER-BEAVER YARN CO.
Successors to A. D. SALKELD & BRO., Inc.
ALL NUMBERS COTTON MERINO **YARNS** ALL COLORS WOOL WORSTED
366 BROADWAY, NEW YORK

STENCILS FOR COTTON SHIPPERS, COTTON MILLS, MERCHANTS & MANUFACTURERS - ALSO BRUSHES, INK, MARKING POTS
RUBBER STAMPS, NOTARIAL AND CORPORATION SEALS
ATLANTA RUBBER STAMP & STENCIL WORKS
OFFICE 33 LUCKIE ST. WORKS 330 EDGEWOOD AVE.
P.O. BOX 859 — OLDEST STENCIL AND STAMP HOUSE IN GEORGIA — ATLANTA, GA.

IF YOU NEED BANKING SERVICE

in the South,
and especially in Georgia

You need The Citizens & Southern

Capital and Surplus $4,500,000

The Citizens & Southern system has completely equipped offices in Atlanta, Savannah, Macon and Augusta.

Each of these offices is connected with the others by direct private wires.

If you are a customer of either office, and want information or service of any kind from the other cities these wires and the complete organization are at your service.

Hundreds of direct correspondents all over the South make it possible to give you practically the same service wherever you want it.

The Citizens & Southern Bank

Atlanta—Marietta at Broad

Savannah Macon Augusta

"No account too large, none too small"

ESTABLISHED 1872

H. & B. BEER

NEW ORLEANS

HENRY BEER EDGAR H. BRIGHT
J. WILLIAM BARKDULL C. MORGAN ABRAMS

MEMBERS OF

New Orleans Cotton Exchange
New Orleans Future Brokers Association
New York Stock Exchange
New York Cotton Exchange
New York Coffee Exchange
New York Produce Exchange
Chicago Board of Trade

Associate Members of the Liverpool Cotton Association

Private Wires to Principal Points

OPPORTUNITIES

ALONG THE LINE OF

The Texas & Pacific Railway

—IN—

TEXAS AND LOUISIANA

For Location of Cotton Mills

The Texas and Pacific Railway serves a number of the most important cotton centers of Texas and Louisiana and traverses the principal cotton producing counties of North Texas and Louisiana.

The State of Texas has only seventeen cotton mills in operation, and is the largest cotton producing State in the Union.

Natural gas, hydro-electric power and water available at many points. Textile producers might well investigate the prospects in Texas and Louisiana for the manufacture of cotton factory products.

ADDRESS

FRANK J. BURKE,
Land and Industrial Commissioner
DALLAS TEXAS

Greatly Reduced
Summer Tourist Fares
"For Your Vacation"

To destinations in Arizona, Arkansas, Canada, California, Colorado, Idaho, Missouri, Montana, New Mexico, Texas, Utah and Wyoming. Choice of going via one route and returning another.

Also to New York, Boston and other points east. Choice of going via steamer from Charleston or Savannah and returning via rail.

Also to Mountain and Seashore Resorts located in the Southeast.

For further information regarding schedules and rates, apply to the undersigned:

J. P. BILLUPS

General Passenger Agent,
Atlanta & West Point R. R.
Georgia Railroad

Atlanta, Ga.

Reduced Summer Fares
TO

COLORADO OREGON
CALIFORNIA CANADA
NEW YORK FLORIDA
NORTH CAROLINA

Convenient Schedules
Attractive Service
VIA

SOUTHERN RAILWAY SYSTEM
ALSO
Extremely Low Week End Fares
TO
Mountain and Seashore Resorts
Inquire

V. L. ESTES, D. P. A.
Broad & Walton Streets
ATLANTA GEORGIA

Beautiful St. Simon's Island
Delightful and Inexpensive Safe Ocean Bathing Beach

Very cheap summer and week-end excursion fares. Through Pullman Sleeping Cars from Atlanta and Intermediate points to Brunswick, via

A. B. & A. RAILWAY

	Week-end Fares	Summer Excursion Fares
Birmingham, Ala	$18.40	$24.50
Talladega, Ala	16.20	21.60
Lineville, Ala	15.00	20.00
Roanoke, Ala.	13.30	17.75
LaGrange, Ga.	12.30	16.35
Atlanta, Ga.	11.90	15.85
Montezuma, Ga.	8.25	11.00
Cordele, Ga.	6.95	8.40
Fitzgerald, Ga.	5.35	7.10
Douglas, Ga.	4.10	5.45

For list of boarding houses, camping sites, or home sites for sale, and other information about Beautiful St. Simon's Island, address

W. W. CROXTON,
Pass. Traffic Mgr., A. B. & A. Rwy.,
ATLANTA GEORGIA

Hotel Sinton

Known by travelers for its unusually large and well-ventilated rooms

CINCINNATI

700 ROOMS 700 BATHS 700 SERVIDORS
MODERATE TARIFFS

Write for Booklet on Cincinnati and The Hotel Sinton. We will also send Mail Order price list of the Famous Hotel Sinton Louis XVI Candies.

HOTEL SINTON Management of John L. Horgan **CINCINNATI**

A Matter of Economy

The MARTINIQUE

IS GLAD TO ANNOUNCE REDUCED RATES

SOMEONE must take the initiative in making it possible for people to travel and spend less money—now that there is less money to spend.

So, hand in hand with Hotel McAlpin which recently announced its reductions, the Martinique—just across the street and under the same management—becomes a leader in lowering hotel tariff.

This is setting an advance style, as it were, for there has not been an appreciable reduction in the cost of running a large New York hotel.

If, however, the public esteems the spirit in which it is done, as much as the management of the McAlpin and Martinique appreciates its patronage, then indeed, is it worth doing.

At the Martinique the new prices are: $3.50 up for rooms and bath; $2.50 for room without bath.

The
MARTINIQUE
Broadway, at 32nd St., New York
Frank E. Jago, Resident Manager

ATLANTA'S NEW MILLION DOLLAR HOTEL
POPULAR PRICED
HOTEL CECIL
COFFEE SHOP—ROOF GARDEN

312 ROOMS—FIRE PROOF—312 BATHS
RATES PER DAY, EUROPEAN PLAN

	ONE PERSON	TWO PERSONS
22 ROOMS AND BATH	$1.50	
104 ROOMS AND BATH	2.00	$3.00
104 ROOMS AND BATH	2.50	4.00
53 ROOMS AND BATH	3.00	5.00
14 ROOMS AND BATH	4.00	6.00
8 ROOMS AND BATH TWIN BEDS		5.00
7 ROOMS AND BATH TWIN BEDS		7.00

H. R. and C. R. CANNON, Proprietors
J. F. deJARNETTE, Manager
OPERATING
GEORGIAN HOTEL, ATHENS, GA. TERMINAL HOTEL, ATLANTA, GA.

WHEN YOU GO TO SAINT LOUIS
STOP AT
Hotel Claridge
Locust Street at 18th
Three Blocks from Union Station
New 12 Story Fireproof Building

Finest Transient and Residential Hotel in St. Louis. In the heart of the Wholesale and Retail Shopping District. 350 Large, Light, Airy Rooms; Private Tub Bath in each Room. Circulating Ice Water and Every Modern Appointment of Comfort and Convenience.

European Plan—Rates

75 Rooms at $2.5^ a day
100 Rooms at $3.00 a day
100 Rooms at $3.50 a day
75 Rooms at $4.00 a day

Excellent Cuisine, Moderate Priced Restaurant, Popular Cafeteria. Write or Wire for Reservations.

R. L. MEYER, *Manager*
Formerly Hotel Statler

4-70

EUROPEAN PLAN
Rooms 600 Baths
Headquarters in Detroit for
OLD COLONY CLUB
DETROIT AUTOMOBILE CLUB

. . DAILY RATES . .

100 at $2.50 Single—$4.50 Double
150 " $3.00 " —$5.00 "
100 " $4.00 " —$6.00 "
50 " $5.00 " —$7.00 "
50 with Twin Beds, $5.00 to $7.00
100 In Suite, $5.00 to $8.00, Double
Two Floors of Agents' Sample Rooms $5.00 per Day
Table d'Hote Dinner, $1.00-$1.50

HOTEL TULLER
Under New Management
CAFETERIA O. C. FROMAN, Mgr. GRILLE
Business Men's Lunch 50c-75c

CLASSIFIED ADVERTISING

RATES:

DISPLAYED.

"For Sale" and all other advertisements using bold-face type or otherwise displayed, $2.00 per inch per insertion.

Rates for larger spaces furnished on application.

WITHOUT DISPLAY.

"Positions Wanted" 3 cents per word per insertion. Minimum charge 50 cents. Payable in advance.

"Positions Open" and other undisplayed advertisements, 4 cents per word per insertion. Minimum charge $1.00. Payable in advance.

(When replies are to be received in our care, allow four words for box address.)

FOR SALE

A COMPLETE PLANT OF 24 CROMPTON & KNOWLES 96 inch Jacquard Looms, now running on fine colored mitcheline Bed Spreads, including beaming, winding, sewing and fringing machines. Owner retiring.

ADDRESS BOX 49, CARE OF "COTTON," ATLANTA, GA.

WANTED
An Experienced Bleacher

with some knowledge of dyeing. The bleaching consists principally of towels (some with colored borders), crashes, etc. The dyeing is on yarns, twines, burlaps, etc. This is not a large plant but the position will be an attractive one for the right man.

Address

"Box A,"
care COTTON,
Atlanta, Ga.

PATENT—Cotton Pick Sack, Two in One. The Cost of Manufacturing not over two cents more than the common plain sack; offer cash or Royalty.

Write N. S. COLE, Newbern, Tenn.

LAUNDRY MACHINERY.

Complete equipment made by the American Laundry Machinery Co. New—never been uncrated.

Will Sell Cheap.

SUMMERVILLE COTTON MILLS

SUMMERVILLE, GA.

New and Second Hand

ENGINES

Corliss Automatic and Slide Valve

BOILERS

Pumps, Hoisting Engines, Gas and Gasoline Engines.

MACHINE TOOLS

Lathes, Planers, Shapers, Drill Presses, etc.

WOOD WORKING

Planers, Molders, Band Saws, etc.

ELEC. MACHINERY

Dynamos and Motors

AND SUPPLIES OF ALL KINDS

FRANK TOOMEY, Inc.,

127-31 N. Third St.

Philadelphia, - Pennsylvania

Selling Agency Wanted

Wanted selling agency for yarn, thread, cloth, tape or braiding—mill, active up-to-date selling force. Can advance if needful.

HAMILTON

115 Franklin St., New York City

Do You Want to Sell it?

Probably you, like many other mills, have some equipment or machinery which you have taken out, or are thinking of taking out and replacing with new equipment.

Why not dispose of this second-hand equipment at a profit? COTTON is read by thousands of Cotton Mills that are hardly touched by Northern journals.

You Can Sell Your Second-Hand Equipment

to these mills through advertising in the Classified Advertising Section of COTTON. Such advertising produces results at small cost—why not try it out and get that second-hand equipment off your hands in a profitable way? Tell us what you have for sale and let us insert an advertisement for you.

COTTON

Grant Bldg., Atlanta, Ga.

MACHINERY BARGAINS

for Textile Mills

The Nashville Industrial Corporation, purchasers of the $87,000,000 Old Hickory Powder Plant, has released a large amount of machinery for immediate sale, a large portion of which is very desirable for use in textile plants. None of this equipment was in use over 90 days, and while in practically new condition it is offered at second-hand prices.

Special Bulletins covering various kinds of equipment will be sent on request.

A few of the many offerings:

PUMPS.

8—14-in. Worthington Class B, double suction, 8500 G.P.M. at 152 ft. head, at 1170 R.P.M., direct connected to 300 hp. G.E., 3 phase, 60 cycle, 2200 volt motors.

4—14-in. Allis-Chalmers, Type S, 7500 G.P.M. at 130 ft. heat at 1760 R.P.M., direct connected to 300 h.p. General Electric, 3 phase, 60 cycle, 2200 volt motors.

2—10-in. Allis-Chalmers, Type S, 3750 G.P.M. at 130-ft. head at 1765 R.P.M., direct connected to 150 h.p. Westinghouse 3 phase, 60 cycle, 2200 volt motors.

6—16-in. Allis-Chalmers, Type S, 8500 G.P.M. at 90-ft. head, direct connected to Type L, 300 h.p., 2000 R.P.M. G.E. Curtis steam turbine.

6—14-in. Allis-Chalmers, Type S, 6500 G.P.M. at 150-ft. head, 8100 G.P.M. at 90-ft. head, direct connected to 300 h.p. 2000 R.P.M. G.E. Curtis steam turbine.

1—20 x 12 x 16 Worthington duplex Underwriters fire pump, 1500 G.P.M., 100 lb. pressure.

200—New and used simplex and duplex, steam driven, Worthington pumps, 4½x3¾x4, 5½x4¾x5, 6x4x6, 7½x4½x10, 6x2½x6.

100—New and used belted 2½", 3", 5", 5", and 6" centrifugal pumps.

Bulletin No. 8 gives complete specifications of all Pumps.

BLOWERS.

2—18-in. Type C. American Electric Exhaust Fans.
10—18-in Buffalo Electric Disc Exhaust Fans.
6—24-in. Buffalo Electric Disc Exhaust Fans, Emerson Motors.
28—24-in. Buffalo Electric Disc Exhaust Fans, E. S. C. Motors.
64—30-in. Buffalo Electric Disc Exhaust Fans, Emerson Motors.
18—30-in. Buffalo Electric Exhaust Fans, Sprague Motors.
5—No. 1 Buffalo Baby Conoidal Fans, Emerson Motors.
4—No. 2 Buffalo Baby Conoidal Fans, Emerson Motors.
4—No. 3 Buffalo Baby Conoidal Fans, Emerson Motors.
15—No. 4 Buffalo Baby Conoidal Fans, Emerson Motors.
All the above equipped with standard A.C. Motors.

BLOWERS—continued.

5—No. 3 Buffalo Niagara Conoidal Fans.
10—No. 4½ Buffalo Niagara Conoidal Fans.
25—No. 6 Buffalo Niagara Conoidal Fans.
15—No. 7 Buffalo Niagara Conoidal Fans.
1—No. 9 Buffalo Niagara Conoidal Fan.
10—No. 4 Buffalo "B" Volume Blowers.
5—No. 5 Buffalo "B" Volume Blowers.
2—No. 6 Buffalo "B" Volume Blowers.
5—No. 8 Buffalo "B" Volume Blowers.
10—No. 1 Low Pressure Gas Exhausters.
10—30-in. Buffalo Standard Reversible Mill Exhausters.
25—50-in. Buffalo Standard Reversible Mill Exhausters.
10—No. 4 24-in. Buffalo Steel Pressure Blowers.
7—Roots Style D, High Pressure Type Blowers, capacity 890 cu. ft. per minute.
2—Connersville Blowers, capacity 3,200 cu. ft. per minute.
Write for Bulletin No. 11 giving complete specifications.

TRANSMISSION.

Thousands of pulleys, including pressed steel, split cast iron and solid cast iron, ranging in diameter from 6 to 56 inches, and in width from 2 to 32 inches, are included with the material at Old Hickory.

Also hundreds of tons of cold rolled shafting up to six inches in diameter, pillow blocks, drop hangers, ring-oiling, capillary and standard bearings, flange couplings, ribbed couplings, grim death couplings, wall brackets, floor stands, pillow block frames, friction clutches, cut-off couplings, sleeves, collars, etc.

We can supply complete line shafts or any transmission equipment needed. Write for Bulletin No. 15.

TANKS.

1500—New and used steel Tanks, small sizes. Mixing tanks, storage tanks, boiling tanks, pressure tanks, and open tanks.
2000—Wood tanks. All sizes.
Hydro-Extractors, Cotton Washers and Dryers, Mixing Pickers, Rinsers, etc.
Electrical Supplies of all kinds.

Write for Catalogues.

NASHVILLE INDUSTRIAL CORPORATION

JACKSONVILLE, TENN.

Buyers' Index

ACETYLENE GAS.
Commercial Acetylene Supply Co.
Oxweld Acetylene Co.
Standard Gas Products Co.

ACETYLENE WELDING APPARATUS.
(See Welding Apparatus.)

ACCOUNTANTS.
American Audit Co.
Ernst & Ernst.

ACCOUNTING SYSTEMS.
Ernst & Ernst.

ADDING MACHINES.
Monroe Calc. Mch. Co.

AIR WASHERS.
Bayley Mfg. Co.
Buckeye Blower Co.
Carrier Eng. Corp.
Grinnell Co.
Parks-Cramer Co.

AIR COMPRESSORS.
(See Compressors.)

(See Humidifying Apparatus.)

AIR CONDITIONING SYSTEMS.

ALBONE.
Roessler & Hasslacher Chemical Co.

ALKALIES.
(See Dyestuffs and Chemicals.)

ANILINE COLORS.
(See Dyestuffs and Chemicals.)

ANTI-CHLORINE.
(See Dyestuffs and Chemicals.)

ANTI-CHLORINE ACID GENERATOR.
Macomb Machine Co.

APPRAISAL SERVICE.
American Appraisal Co.

APRONS—RUB.
Bond Co., Chas.
Smith & Furbush Machine Co.

ARCHITECTS AND ENGINEERS.
Robert & Co.
Spiker & Lose
Sirrine, J. E.
Stuhrman, Edw. A.
Thompson & Binger, Inc.

ASH HANDLING MACHINERY.
(See Coal Handling Machinery.)

ASPHALT SLATE SHINGLES.
(See Slate Asphalt Roofing.)

ASPIRATORS.
Belger Co.

AUDITORS AND ACCOUNTANTS.
American Audit Co.
Ernst & Ernst.

AUTO TRUCKS.
(See Trucks—Auto.)

AUTOMATIC CONTROLLERS (TEMPERATURE).
(See Temperature Controllers.)

AUTOMATIC LOOM ATTACHMENTS.
(See Loom Attachments.)

AUTOMATIC FEEDS FOR COTTON.
Brooks & Doxey, Ltd.
Lord Bros.
Proctor & Schwartz, Inc.
Saco Lowell Shops.
Sargent's Sons Corp., C. G.
Smith & Furbush Mch. Co.
Whitin Mch. Works.

AUTOMATIC GUIDER (ELECTRIC).
Blake Electric Mfg. Co.

AUTOMATIC SCALES.
(See Scales.)

AUTOMOBILES.
Packard Motor Car Co.
White Co.

BACKWASHERS.
Sargent's Sons Corp., C. G.

BAROMETERS.
Taylor Instrument Co.

BALL BEARINGS.
Aldrich Mch. Works
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
Skayef Ball Bearing Co.
U. S. Ball Bearing Co.

BALL BEARING HOUSINGS.
Aldrich Mch. Works
Fafnir Bearing Co.
U. S. Ball Bearing Co.

BALE BAND BUCKLES.
(See Box Strapping & Buckles.)

BALE OPENERS.
(See Openers.)

BALING MACHINES.
Brooks & Doxey, Ltd.
Lord Bros.
Crompton & Knowles Loom Wks.
Draper Corporation.
Economy Baler Co.
Famous Mfg. Co.
Saco-Lowell Shops.

BALING PRESSES
(See Presses.)

BANDAGES, TAPES, ETC.
American Textile Banding Co.
Weimar Bros.

BANDAGE & TAPE MACHINES
Foster Machine Co.

BANDS.
(See Tapes.)

BANKS.
Atlanta National Bank.
Citizens & Southern Bank.
National Shawmut Bank

BARRELS—FIBRE.
(See Fibre Products.)

BASKETS—MILL.
(See Boxes—Mill.

BATH CABINET—SHOWER.
Crane Co.
Sanymetal Products Co.

BATTERIES (ELEC.)
(See Storage Batteries.)

BEAMS.
Mossberg Pressed Steel Corp.
Walraven Co.

BEAM DYEING MACHINES.
Brandwood, John
Cocker Mchry. & Foundry Co.

BEAM HEADS.
Jordan Mfg. Co.
Mossberg Pressed Steel Corp.
Walraven Co.

BEAMING AND WARPING MACHINERY.
(See Warpers and Warping Machinery.)

BEARINGS.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
Skayef Ball Bearing Co.
U. S. Ball Bearing Co.
Wood's Sons Co., T. B.

BELTING (LEATHER, CANVAS AND RUBBER).
American Supply Co.
Bond Co., Chas.
Fabreeka Belting Co.
Walraven Co.
Williams & Sons, I. B.

BELTING—CHAIN.
Link-Belt Company.
Morse Cha'n Co.

BELTING (ROUND—LEATHER).
Bond Co., Chas.

BELTING—ROPE.
(See Rope Transmission.)

BELT CONVEYORS.
Brown Co., A. & F.
Dodge Sales & Eng. Co.
Link-Belt Company.
Morse Chain Co.

BELT DRESSING.
Bond Co., Chas.
Dixon Crucible Co., Jos.
Walraven Co.
Williams & Sons, I. B.

BELT FASTENERS.
Columbia Novelty Mfg. Co.
Flexible Steel Lacing Co.

BELT LACING.
Bond Co., Chas.
Columbia Novelty Co.
Fabreeka Belting Co.
Flexible Steel Lacing Co.
Walraven Co.
Williams & Sons, I. B.

BELT TIGHTENERS.
Brown Co., A. & F.
Link-Belt Company
Wood's Sons Co., T. B.

BENCH DRAWERS.
Lupton's Sons Co., David.

BENCH LEGS (PRESSED STEEL).
Lupton's Sons Co., David.

BENCHES (PARK AND PLAYGROUND).
(See Playground Equipment.)

BLEACHERIES.
(See Dyers, Bleachers and Finishers.)

BLEACHING KIERS.
Butterworth & Sons Co., H. W.
Chicago Bridge & Iron Wks.
Cole Mfg. Co., R. D.
Hauser-Stander Tank Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Machry. Co.

BLEACHING MACHINERY.
(See Dyeing, Bleaching and Finishing Machinery.)

BLEACHING, FINISHING AND SIZING MATERIALS.
(See Finishing Materials.)

BLOWERS AND BLOWER SYSTEMS
Bayley Mfg. Co.
Buckeye Blower Co.
Carlisle & Gale Co.
Carrier Eng. Corp.
Clements Mfg. Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

BOARDS—FIBRE.
Diamond State Fibre Co.

BOARDS—FORM.
Pearson, Jos. T.

BOARD PANELS FOR WALLS AND CEILINGS.
Cornell Wood Products Co.

BOBBINS.
Draper Corporation.
Jordan Mfg. Co.
Shambow Shuttle Co.
Vermont Spool & Bobbin Co.
Walraven Co.
Whitin Machine Works.

BOBBIN HEADS.
Jordan Mfg. Co.
Vermont Spool & Bobbin Co.

BOILERS.
Cole Mfg. Co., R. D.
International Engineering Wks., Inc.
Lombard Iron Works & Supply Co.
Nashville Industrial Corp.
Schofield's Sons Co., J. S.
Toomey, Frank
Walsh & Weidner Boiler Co.

BOILER COMPOUNDS.
Dixon Crucible Co., Jos.

BOILER FEED WATER PURIFICATION.
American Water Softener Co.
Norwood Engineering Co.
Scaife & Sons, Wm. B.

BOILER ROOM FITTINGS AND SUPPLIES.
Burt Mfg. Co.
Crane Co.
Dixon Crucible Co., Jos.
International Engineering Co.
Jenkins Bros.
Nashville Industrial Corp.
Oster Mfg. Co.
United Machine & Mfg. Co.

BOILER GRATES AND STOKERS.
(See Grates and Stokers.)

BOOKKEEPING MACHINES.
Monroe Calc. Mch. Co.

BOX STRAPPING AND TIE BUCKLES.
(See Banding Straps and Buck-

BOXES—MILL.
Hightower Box & Tank Co.
Lewis Co., G. B.
Lyon Metallic Mfg. Co.
Standard Fibre Co.
Walke Box Co.

BOXES—PACKING.
(See Packing Boxes.)

BRAID.
(See Tapes.)

BRAZING.
(See Welding.)

BROKERS—COTTON.
(See Cotton Dealers & Brokers.)

BROKERS—STOCK.
(See Stocks and Bonds.)

BROOMS.
(See Brushes.)

BRUSHES—MILL.
Atlanta Brush Co.
Southwestern Broom Mfg. Co.

BRUSHES—MOTOR AND GENERATOR (COMMUTATOR).
Dixon Crucible Co., Jos.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

BUCKETS AND PAILS—MILL.
Standard Fibre Co.

BUCKETS—ELEVATOR AND GRAB.
Link-Belt Company

BUCKLES—COTTON TIE.
(See Box Strapping and Ties.)

BUILDING CONTRACTORS.
(See Contractors.)

BUILDING MATERIAL.
Anchor Post Iron Works.
Barrett Co., The
Birmingham Slag Co.
Cornell Wood Products Co.
Dixie Portland Cement Co.
Drouve Co., G.
Dufur & Co.
Hough Shade Corp.
Knapp Fence Co.
Lupton's Sons Co., David.
Rose Bros.
Sanymetal Products Co.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.

BURR PICKERS.
Sargent's Sons, C. G.
Smith & Furbush Machine Co.

BUSHINGS.
Brown Co., A. & F.
Dodge Sales & Eng. Co.
Southern Spindle & Flyer Co.
Walraven Co.

BUSINESS METHODS.
Ernst & Ernst.

CABINETS.
(See Lockers.)

CALCULATING MACHINES.
Monroe Calculating Mch. Co.

CALENDERS.
Butterworth & Sons Co., H. W.
Textile Finishing Mchry. Co.

CALENDER ROLLS.
(See Rolls—Calender.)

CALLING SYSTEM—INTERTELEPHONE.
Carter Electric Co

CAMLESS DETACHING DEVICES.
Belger Co.

CANS—ROVING.
Standard Fibre Co.

CAN INDICATORS (ROVING).
O'Malley & Carroll.

CARS AND TRUCKS—FIBRE.
(See Trucks.)

CARBONIZING MACHINES.
Cocker Mch. & Fdry. Co.
Grinnell Co.
Klauder-Weldon Dyeing Machine Co.
Macomb Machine Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Sargent's Sons & Co., C. G.
Textile Finishing Mchry. Co.
Tolhurst Mch. Works.

CARDING MACHINERY AND SUPPLIES.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Southern Spindle & Flyer Co
Whitin Machine Works.

CARD CLOTHING.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

CARD FEEDS.
Brooks & Doxey, Ltd.
Lord Bros.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Co.

CARD GRINDING MACHINERY
Roy & Son Co., B. S.
Smith & Furbush Mach. Co.
Whitin Machine Works.

CARPET MACHINERY.
Butterworth, H. W. & Sons Co.
Crompton & Knowles Loom Works.
Proctor & Schwartz, Inc.
Schofield, Wm. Co.
Smith & Furbush Mach. Co.
Textile Finishing Mchry. Co.

CARRIER APRONS.
(See Aprons.)

CARRIER SYSTEM.
Curtis Pneumatic Machinery Co.

CASES—WOODEN.
(See Boxes.)

CASTINGS.
Briggs, Shaffner Co.
Cole Mfg. Co., R. D.
Cresson-Morris Co.
Lombard Fdry. & Mch. Co.
Walsh & Weidner Boiler Co.

CAUSTIC SODA.
(See Bleaching Materials.)

CEILINGS (WOOD PANEL).
Cornell Wood Products Co.

CEMENT.
Dixie Portland Cement Co.

CEMENT REINFORCEMENT.
Birmingham Slag Co.

CEMENT AND BRICK COATING.
American Cement Paint Co.
Dixon Crucible Co., Jos.
Du Pont de Nemours & Co., E. I.
Wadsworth, Howland & Co., Inc.

CENTRAL STATION (ELECTRIC).
Alabama Power Co.
Georgia Railway & Power Co.

CENTRIFUGALS.
Cresson-Morris Co.
Fletcher Works.
Goulds Mfg. Co.
Schaum & Uhlinger.
Tolhurst Mch. Wks.
U. S. & Cuban Allied Works Eng'g Corp.

CHAIN DRIVES.
(See Belting—Chain Link.)

CHAIN—BLOCK, BICYCLE, AUTO, ENGINE, AGRICULTURAL, ETC.)
Morse Chain Co.

CHAIRS AND STOOLS.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.
Southern Theatre Equip. Co.

CHECK STRAPS.
Bond Co., Chas
Jacobs Mfg. Co., E. H.

CHEMICALS.
(See Dyestuffs and Chemicals.)

CHLORINE GAS.
Electro Bleaching Gas Co.

CLEANING MACHINE—BLOWER.
Clements Mfg. Co.

CLEARER CLOTH.
Philadelphia Felt Co.

CLOCKS—HANK, ETC.
(See Counters.)

CLOCKS—WATCHMAN.
Foxboro Co., Inc.

CLOSETS—WATER.
(See Toilets.)

CLOTH—ROLLER, CLEARER, SLASHER.
Philadelphia Felt Co.

CLOTH CUTTERS.
Firsching, J. A.
Wildman Mfg. Co.

CLOTH GUIDER (ELECTRIC).
Blake Electric Mfg. Co.

CLOTH REELS.
Gallaudet Aircraft Corp.

CLOTH ROOM MACHINERY.
Brooks & Doxey, Ltd.
Butterworth, H. W., & Sons Co.
Firsching, J. A.
Grinnell Co.
Lord Bros.
Saco-Lowell Shops.
Textile Finishing Mchry. Co.
Textile Service & Equip. Co.
Williams Co., J. H.
Wildman Mfg. Co.

CLOTH SHRINKING MACHINERY.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Tolhurst Mch Wks.

CLOTH WINDERS.
(See Winders.)

CLUTCHES—FRICTION.
Allis-Chalmers Mfg. Co.
Brown Co., A. & F.
Carlyle-Johnson Machine Co.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Link-Belt Company.
Mason, Volney W.
Wood's Sons Co., T. B.

CLUTCH LININGS.
Brown Co., A. & F.

COAL AND ASH HANDLING MACHINERY.
Link-Belt Company.

COAL TAR DISINFECTANTS.
(See Disinfectants.)

COCKS.
(See Valves.)

COLOR PAILS.
(See Buckets—Mill.)

COMB APRONS.
(See Aprons.)

COMBERS AND COMBER SUPPLIES.
Belger Co.
Whitin Machine Wks.

WRITE US
for catalog on
other
Mill Receptacles.

No-Waste
SEAMLESS ROVING CANS

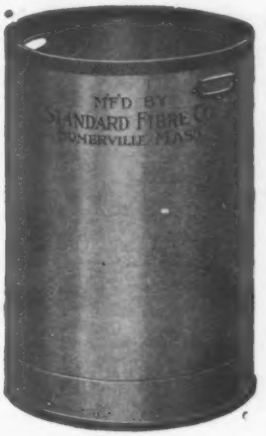
Waste Baskets
Taper Baskets
Oval Cans
Elliptical Cans

Sizes
9"-10"-11"-12"-14"-18"
diameters
and
up to 45" high

NO
seams, joints,
or
Rivets.

Styles

Polished
Steel
or
Rolled Fibre
Top Rims
Rings
BEADED
securely
to
Hard Fibre
Shells.



Hard Fibre
MILL BARRELS
Plain Fibre
and
NEW PATTERN
Steel Clad
Trucks and Boxes

Combination
Doffing Cars

STANDARD FIBRE CO.
Somerville, Massachusetts

Schofield Patent Automatic Opener and Duster

For opening and dusting Wool, Cotton, Linters, Hair and kindred fibrous substances.

"Schofield" intermediate feeds for Cards, Wool, Rag, Waste, Hair and Lumper Pickers, Automatic, Cone and Oldham Willows, Rag and Extract Dusters, Waste Pullers, Blamaine Lap Feeds, Curled Hair Pickers, Needle Looms, etc.

WILLIAM SCHOFIELD COMPANY
Iron Founders, Textile Machinery Builders.
Krams Ave., Manayunk, Philadelphia, Pa.

HORTON TANKS

SERVE COTTON MILLS AND MILL COMMUNITIES WELL

We furnish full information, or plans, specifications and estimates without obligating you.

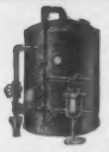
CHICAGO BRIDGE & IRON WORKS
NEW YORK — 3130 Hudson Terminal
ATLANTA — 1042 Forsyth Bldg.

SOFT WATER - CLEAR WATER
FOR EVERY PURPOSE

DECALSO ZERO WATER SOFTENERS
LIME AND SODA WATER SOFTENERS
PRESSURE AND GRAVITY FILTERS

SOFTENER

FOR PARTICULARS ADDRESS
AMERICAN WATER SOFTENER CO.
LEHIGH AVE. AT 4TH ST.
PHILADELPHIA, PA.


FILTER

PUMPS

INDUSTRIAL — AGRICULTURAL — MUNICIPAL — RESIDENTIAL

A type for every service.
Bulletins on request.

The Goulds Manufacturing Company
SENECA FALLS, N. Y.

GOULDS

BUYERS' INDEX—Continued.

COMMISSION MERCHANTS & DEALERS.
(See Cotton Cloth Commission Merchants.)

COMPRESSORS—AIR, GAS, ETC.
Allis-Chalmers Mfg. Co.
General Electric Co.
Goulds Mfg. Co.
U. S. & Cuban Allied Works Eng'g Corp.
Walraven Co., The.

COMMUTATOR BRUSHES.
(See Brushes—Motor and Generator.)

CONCRETE REINFORCEMENT.
Birmingham Slag Co.

CONCRETE FORMS (STEEL).
Blaw-Knox Co.

CONDENSERS.
Allis-Chalmers Mfg. Co.

CONDUITS.
(See Elec. Machinery & Supplies.)

CONNECTORS—FRANKEL SOLDERLESS.
Westinghouse Elec. & Mfg. Co.

CONSULTING ENGINEERS.
(See Architects and Engineers.)

CONTRACTORS AND ENGINEERS—BUILDING.
Foundation Co.
Sirrine & Co., J. E.
Spiker & Lose.
Stuhrman, Edw. A.
Thompson & Binger, Inc.

CONTRACTORS——ELECTRICAL.
(See Electrical Engineers.)

CONTROLLING INSTRUMENTS—TEMPERATURE.
Foxboro Co., Inc.
General Electric Co.
Powers Regulator Co .
Taylor Instrument Co.

CONVEYORS—BELT.
(See Belt Conveyors.)

CONVEYING MACHINERY.
American Supply Co.
Chisholm-Moore Mfg. Co.
Collins, J. D.
Cresson-Morris Co.
Curtis Pneumatic Mchry. Co.
Link-Belt Co.
Mason, Volney W.
Morse Chain Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Schofield, Wm. Co.
Walraven Co.

CONVEYORS—PORTABLE.
Link-Belt Co.

COOLERS.
(See Humidifying Apparatus.)

COOLERS—WATER.
(See Water Coolers.)

COOLING AND CONDITIONING MACHINES.
Grinnell Co.

COOLING TOWERS.
(See Tanks and Towers.)

COPPER STAMPS AND STENCILS.
(See Stamps, Stencils, etc.)

CORDAGE MACHINERY.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co., The.

COST SYSTEMS.
Ernst & Ernst.

COTTON YARN AND CLOTH COMMISSION MERCHANTS AND DEALERS.
Aberfoyle Mfg. Co.
Boger & Crawford
Carver-Beever Yarn Co., Inc.
Fawcett, Hughes.
Florsheim, H. A.
Hunter Mfg. & Comm. Co.
Lane & Co., J. H.
Weimar Bros.
Woodward, Baldwin & Co.

COTTON MERCHANTS AND BROKERS.
Beer, H. & B.

COTTON MILL MACHINERY AND SUPPLIES.
Atlanta Harness & Reed Mfg. Co.
Barber-Colman Co.
Belger Co.
Blake Electric Mfg. Co.
Brooks & Doxey, Ltd.
Butterworth & Sons, H. W.
Cocker Mach. & Foundry Co.
Crompton & Knowles Loom Works.
Draper Corporation.
Eclipse Textile Devices, Inc.
Firsching Co., J. A.
Fletcher Works.
Foxboro Co., Inc.
Gallaudet Aircraft Corp.
Greist Mfg. Co.
Grinnell Co.
Howard & Bullough.
Hunt Machine Co., Rodney.
Jacobs Mfg. Co., E. H.
Lestershire Spool & Mfg. Co.
Lord Bros.
Mates-Brown Co., Inc., B. P.
Mossberg Pressed Steel Crop.
O'Malley & Carroll.
Phila. Drying Mchry. Co.
Philadelphia Felt Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield Co., Wm.
Shambow Shuttle Co.
Smith & Furbush Mach. Co.
Southern Bending Co.
Stafford Co.
Steel Heddle Mfg. Co.
Suter, Alfred.
Terrell Machine Co.
Textile Finishing Machinery Co.
Textile Specialty Co.
Tolhurst Mch. Wks.
Universal Winding Co.
Vermont Spool & Bobbin Co.
Walraven Co.
Williams Co., J. H.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

COTTON TAPE LOOM.
Fletcher Works.
Schaum & Uhlinger.

COTTON YARN MILLS.
(See Yarn Manufacturers.)

COUNTERS—REVOLUTION, HANK, PICK, ETC.
Foxboro Co.

COUNTERS—RESTAURANT.
(See Restaurant Equipment.)

COUPLING—SHAFT.
Cresson-Morris Co.
Wood's Sons Co., T. B.

COVERING—ROLLER.
Bond Co., Chas.
Philadelphia Felt Co.

CRANES.
(See Hoists.)

CREELS (AUTOMATIC).
Suter, Alfred.

CREOSOTED FLOORING, BLOCKS, POSTS, SHINGLES, ETC.
Southern Wood Preserving Co.

CULVERTS.
Dixie Culvert & Metal Co.

CUTTERS—CLOTH.
(See Cloth Cutters.)

CYPRESS LUMBER.
Southern Cypress Mfg. Asso.

CUTTERS—THREAD.
(See Thread Cutters.)

DELIVERY CASES.
(See Boxes—Packing.)

DESKS—FACTORY.
Lupton's Sons Co., David.

DIAL SCALES.
(See Scales.)

DIES—STEEL.
(See Stamps, Stencils, Etc.)

DIE STOCKS.
(See Pipe Threaders.)

DISINFECTANTS.
Barrett Co., The.
Sanitas Co.

DOBBY CHAINS.
Crompton & Knowles Loom Wks.
Whitin Machine Works.

DOFFING BOXES—MILL.
(See Boxes—Mill.)

DOFFING CARS.
(See Cars.)

DOORS—STEEL.
Lupton's Sons Co., David.

DOUBLING MACHINERY.
Brooks & Doxey, Ltd.
Lord Bros.

DRAINAGE ENGINEERS.
Dixie Culvert & Metal Co.

DRAWING FRAMES.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Whitin Machine Works.

DRILLS—ELECTRIC.
(See Electric Machinery.)

DRINKING FOUNTAINS.
(See Fountains—Drinking.)

DROP WIRES.
Draper Corp.
Greist Mfg. Co.
Mossberg Pressed Steel Corp.
Steel Heddle Mfg. Co.
Williams Co., J. H.

DRYING APPARATUS.
Bayley Mfg. Co.
Buckeye Blower Co.
Grinnell Co.
Proctor & Schwartz ,Inc.

DRYING FORMS—HOSIERY.
Pearson, Jos. T.

DRYING MACHINERY.
American Laundry Mchry. Co.
Butterworth, H. W., & Sons Co.
Grinnell Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.

DUST COLLECTORS.
(See Blowers and Blowing Systems.)

DUSTING MACHINERY.
Schofield Co., Wm.
Smith & Furbush Mach. Co.

DYERS, BLEACHERS AND FINISHERS.
American Yarn & Processing Co.
Boger & Crawford.
Dixie Mercerizing Co.
Franklin Process Co.

DYEING, BLEACHING, FINISHING AND PRINTING MACHINERY AND EQUIPMENT.
American Laundry Mchry. Co.
Brandwood, John.
Butterworth & Sons Co., H. W.
Cocker Mch. & Fdry. Co.
Cole Mfg. Co., R. D.
East Jersey Pipe Co.
Electro Bleaching Gas Co.
Firsching, J. A.
Fletcher Works.
Franklin Process Co.
Grinnell Co.
Hauser-Stander Tank Co.
Hunt Mach'ne Co., Rodney.
Klauder-Weldon Dyeing Mch. Co.
Macomb Machine Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Schaum & Uhlinger.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.
U. S. & Cuban Allied Works, Eng'g Corp.

DYEING MACHINES (PACKAGE AND SPOOL.
Brandwood, John.
Franklin Process Co.

DYE STICKS.
Phila. Drying Machinery Co.

DYESTUFFS AND CHEMICALS.
Arnold, Hoffman & Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Ciba Co., Inc.
Du Pont de Nemours & Co., E. I.
Electro Bleaching Gas Co.
Ford Co., J. B.
Grasselli Chemical Co.
India Alkali Works.
Kali Mfg. Co.
Mates-Brown Co., Inc., B. P.
Metz & Co., H. A.
National Aniline & Chemical Co.
Newport Chemical Works, Inc.
Roessler & Hasslacher Chemical Co.
Sandoz Chemical Co.
Sonneborn Sons, Inc., L.
Staley Mfg. Co., A. E.
Surpass Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques.

ELASTIC STOCKINGS.
Estes Surgical Supply Co.

ELECTRIC CONDUIT AND FITTINGS.
(See Electrical Machinery and Supplies.)

ELECTRIC DYNAMOS AND MOTORS.
(See Motors and Generators.)

ELECTRIC FANS.
(See Fans—Electric.)

ELECTRIC LAMPS.
(See Lamps.)

ELECTRIC LAMP GUARDS.
Flexible Steel Lacing Co.
Ivanhoe Regent Works.

ELECTRICAL ENGINEERS AND CONTRACTORS.
Curtis, Paul W.
Huntington & Guerry, Inc.
Ivanhoe Regent Works.

ELECTRIC LIGHTING ENGINEERS.
(See Illuminating Engineers.)

ELECTRICAL MACHINERY AND SUPPLIES.
Allis-Chalmers Mfg. Co.
Bayley Mfg. Co.
Blake Electric Mfg. Co.
Carter Electric Co.
Curtis, Paul W.
Cutter Works, George.
Federal Electric Co.
General Electric Co.
Ivanhoe-Regent Works.
Mason, Volney W.
Walraven Co., The.
Walsh & Weidner Boiler Co.
Westinghouse Elec. & Mfg. Co.

ELECTRIC TRACTORS AND TRUCKS.
(See Tractors and Trucks—Electric.)

ELEVATORS—PORTABLE.
Collins, J. D.

ELEVATORS.
Link-Belt Company.

EMERGENCY SUPPLIES FOR FIRST AID ROOMS.
Estes Surgical Supply Co.

ENAMEL—MILL WHITE.
(See Paint.)

ENGINEERS—MILL.
(See Architects.)

ENGINES—OIL, GAS AND GASOLINE.
Allis-Chalmers Mfg. Co.
Power Mfg. Co.
Walraven Co., The.

ENGINES—STEAM.
Allis-Chalmers Mfg. Co.
Cole Mfg. Co., R. D.
Lombard Iron Works & Supply Co.
Nashville Industrial Corp.
Schofield's Sons Co., J. S.
Toomey, Frank.

ENGINE ROOM APPLIANCES AND SUPPLIES.
Burt Mfg. Co.
Crane Co.
Jenkins Bros.
Oster Mfg. Co.
Power Mfg. Co.
Walraven Co.
Westinghouse Elec. & Mfg. Co.

EXHAUST HEADS.
Burt Mfg. Co.

EXPORTERS—COTTON.
(See Brokers.)

EXTRACTORS—HYDRO.
American Laundry Mchry. Co.
East Jersey Pipe Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Works.
U. S. & Cuban Allied Works, Eng'g Corp.

FACTORY DESKS.
Lupton's Sons Co., David.

FACTORY & INDUSTRIAL SITES.
Alabama Power Co.
Georgia Ry. & Power Co.
Texas &., Pacific Ry.
Nashville Industrial Corp.

FACTORY MANAGEMENT SYSTEMS.
Ernst & Ernst.

FANS—ELECTRIC.
Bayley Mfg. Co.
Buckeye Blower Co.
Carter Electric Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

FANS—CONVEYING, POWER AND EXHAUST.
(See Blowers and Blowing.) Systems.)

FASTENERS—BELT.
(See Belt Fasterers.)

FEED WATER PURIFIERS.
(See Boiler Feed Water Purification.)

FEEDERS.
(See Automatic Feeders.)

FELT CLOTH FOR ROLLS.
Philadelphia Felt Co.

FELTING MACHINERY.
Smith & Furbush Mch. Co.

FENCE—STEEL AND IRON.
Anchor Post Iron Works.
Knapp Fence Co.

FENCE POSTS—CREOSOTED PINE.
Southern Wood Preserving Co.

FIBRE PRODUCTS.
Standard Fibre Co.

FILLING STATION PUMPS.
Bowser & Co., S. F.

FILMS—MOTION PICTURE.
Bromberg Attractions, Arthur C.
Federated Films of Atlanta.
Savini Films, Inc., R. M.
Southern States Film Co.

FILTERS—WATER.
American Water Softener Co.
Norwood Engineering Co.
Scaife & Sons Co., Wm. B.

FILTERS—OIL REMOVAL.
Norwood Engineering Co.

FILTERS (OIL).
Burt Mfg. Co.

FINISHING.
(See Dyers, Bleachers and Finishers.)

FINISHING, BLEACHING AND SIZING MATERIALS.
Arnold, Hoffman & Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Ciba Co., Inc.
Corn Products Refining Co.
Du Pont de Nemours & Co., E. I.
Electro Bleaching Gas Co.
Electric Smelting & Aluminum Co.
Ford Co., J. B.
India Alkali Works.
Kali Mfg. Co.
Keever Starch Co.
Mates-Brown Co., Inc., B. P.
Metz & Co., H. A.
Moore Oil Refining Co.
National Aniline & Chemical Co.
Newport Chemical Works.
Roessler & Hasslacher Co.
Sandoz Chemical Co.
Sonneborn Sons, Inc., L.
Staley Mfg. Co., A. E.
Stearns, Wm. Taylor.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.

FIRE DOORS AND HARDWARE.
Lupton Sons Co . David.
Sanymetal Products Co.

FIRE EXTINGUISHERS.
Grinnell Co.

FIRE HOSE.
(See Hose—Fire.)

FIRE PROTECTING PAINT.
(See Paint.)

FIRST AID ROOM EQUIPMENT AND SUPPLIES.
Estes Surgical Supply Co.

FLEXIBLE COUPLINGS.
Allis-Chalmers Mfg. Co.
Cresson-Morris Co.

FLOOD LIGHTS—ELECTRIC.
General Electric Co.

FLOORING LUMBER.
Hightower Box & Tank Co.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.

FLOORING—WOOD BLOCKS.
Southern Wood Preserving Co.

FLOOR SCRUBBING MACHINE.
American Scrubbing Equipment Co.

FLOOR SCRUBBING POWDERS.
India Alkali Works.

FLOOR SWEEPS.
(See Brushes.)

FLUTED ROLLS.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Schofield & Sons, J. S.
Smith & Furbush Mach. Co.
Southern Spindle & Flyer Co.
Whitin Machine Works.

FLYERS.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

FOUNDERS.
Briggs-Shaffner Co.
Brown Co., A. & F.
Cole Mfg. Co., R. D.
Cresson-Morris Co.
Lombard Fdy. & Mch. Works

FOUNTAINS—DRINKING.
Crane Co.
Miles Refrigerating Co.
Rundle-Spence Mfg. Co.
Taylor, Halsey W.

FRICTION CLUTCHES.
(See Clutches—Friction.)

FUSES—ELECTRIC.
Carter Electric Co.
Federal Electric Co.

GARNETT MACHINES.
Roy & Son Co., B. S.
Smith & Furbush Mch. Co.

GAS ENGINES.
(See Engines—Gas.)

GASKETS.
Walraven Co.

GASOLINE PUMPS AND STORAGE TANKS.
Bowser & Co., S. F.

GAUGE (YARN CLEANER).
Mates-Brown Co., Inc., B. P.

GAUGES—STEAM PRESSURE, ETC.
Foxboro Co., Inc.
Taylor Instrument Co.

GAUGE—OIL.
Brown Co., A. & F.
Lunkenheimer Co.

GEARS—SILENT.
Brown Co., A. & F.
General Electric Co.
Link-Belt Company.
Morse Chain Co.

GEAR CUTTING AND CUTTERS.
Brown Co., A. & F.
Cresson-Morris Co.

MASON'S Whip Hoists

WILL HANDLE MORE BALES IN ONE HOUR THAN 4 ELEVATORS, WITH HALF THE LABOR.

—We MANUFACTURE—
FRICTION PULLEYS AND CLUTCHES

—FOR HOISTING—
—WOOL—AND—COTTON—
OUTRIGGER SERVICE AND HATCHWAYS
HOISTS 25 TO 50 BALES PER HOUR
———IN USE AT———
MILLS, DOCKS, WAREHOUSES, HAY DEPOTS, ETC.
VOLNEY W. MASON & CO., Inc.
PROVIDENCE, R. I., U. S. A.

—1860— ONE ROPE CONTROLS, HOISTS, LOWERS AND HOLDS THE LOAD —1922—

UCPC

A Satisfied Customer Writes to Us from the South "SHIP US AT ONCE A BARREL OF THAT GOOD SULPHUR BLACK"

Let Us Ship You a Barrel Also and You will Be Equally as Well Pleased with Our

SULPHUR BLACK U. C. 200%

UNITED CHEMICAL PRODUCTS CORPORATION
Importers, Jobbers and Manufacturers
York & Colgate Sts. Jersey City, N. J.
Southern Office, 307 Commercial National Bank Building Charlotte, N. C.
REPRESENTATIVES.
R. T. GRANT, Charlotte, N. C.
GEO. W. WATSON, Hazlehurst, Miss.
LINDSAY PADGETT, Shelby, N. C.

SANITAS

Perfection Plus!

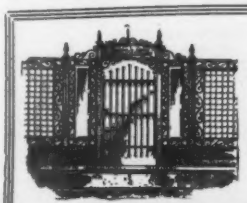
Guaranteed Disinfectants

In keeping with its progressive policy The Sanitas Co. has been the first manufacturer of disinfectants to adopt the revised Hygienic Laboratory Method of the U. S. Public Health Service as a basis for testing, branding and guaranteeing the coefficients of their entire line of first-quality coal tar disinfectants (Coefficients 2 to 16).

When you purchase the Sanitas Brand disinfectants you get a product with 30 to 40% greater germicidal efficiency than a disinfectant of the same coefficient number tested by the Rideal-Walker method, yet the cost of Sanitas products is usually no more than that of inferior products.

Specify *Sanitas products* on your requisition for disinfectants and insist upon getting them. The Sanitas Oval is your guarantee of quality and satisfaction.

THE SANITAS COMPANY Inc.
33 KEAP STREET BROOKLYN, N.Y.



WIRE RAILINGS
WINDOW GUARDS
WIRE CLOTH
Established 1835.
DUFUR & CO.
309 N. Howard St. Baltimore, Md.

SYDNOR'S SUPREME SERVICE

WELL DRILLING
and **DEEP WELL PUMPS**
We do the engineering and have been solving water problems satisfactorily for 25 years for textile mills.
SYDNOR PUMP & WELL CO., INC.,
Richmond, Va.

WATER
WE-FU-GO AND SCAIFE
PURIFICATION SYSTEMS SOFTENING & FILTRATION FOR BOILER FEED AND ALL INDUSTRIAL USES
WM. B. SCAIFE & SONS CO. PITTSBURGH, PA.

BUYERS' INDEX—Continued.

GEAR PULLERS.
General Electric Co.

GENERATORS—ELECTRIC.
(See Motors and Generators.)

GLASSWARE AND DISHES.
(See Dishes.)

GLASS SKYLIGHTS.
Drouve Co., G.

GOVERNORS—PUMP.
General Electric Co.

GRAPHIC CHARTS.
Ernst & Ernst.

GRAPHITE.
Dixon Crucible Co., Jos.

GRATES—BOILER.
Cole Mfg. Co., R. D.
International Eng. Works.
Lombard Fdry. & Mch. Co.
Walsh & Weidner Boiler Co.

GRATES—MECHANICAL.
(See Stokers.)

GREASE.
(See Lubricants.)

GREASE CUPS.
(See Lubricators.)

GRINDERS—CARD, CYLINDER, ROLL, NAPPER AND GARNET.
(See Card Grinding Machinery)

GUARDS—ELECTRIC LAMP.
(See Electric Lamp Guards.)

GUARDS—MACHINE, SKYLIGHT, WINDOW, ETC.
Knapp Fence Co.

GUIDES—THREAD.
Palmer Co., I. E.

GUIDER—CLOTH-ELECTRIC.
Blake Electric Mfg. Co.

GUMS.
(See Finishing and Sizing Materials.)

HANGERS.
(See Shafting and Hangers.)

HARDWARE—BUILDING.
Sanymetal Products Co.

HARNESS—LOOM.
American Supply Co.
Atlanta Harness & Reed Mfg. Co.
Crompton & Knowles Loom Works.
Emmons Loom Harness Co.
Greist Mfg. Co.
Garland Mfg. Co.

HEADS—BOBBIN AND SPOOL.
Leetershire Spool & Mfg. Co.

HEATERS.
Bayley Mfg. Co.

HEATING AND VENTILATING APPARATUS.
(See Ventilating Apparatus.)

HEDDLES.
Crompton & Knowles Loom Works.
Draper Corporation.
Steel Heddle Mfg. Co.
Williams Co., J. H.

HEDDLE FRAMES.
Crompton & Knowles Loom Works.
Steel Heddle Mfg. Co.
Williams Co., J. H.

HOISTS.
Chisholm-Moore Mfg. Co.
Curtis Pneumatic Mchry. Co.
Link-Belt Company.
Mason, Volney W.
Morse Chain Co.
Walraven Co.

HOPPER FEEDERS.
(See Automatic Feeders.)

HOSE—FIRE.
Collins, J. D.
Walraven Co.

HOSIERY DYEING MACHINERY.
Cocker Mch. & Fdry. Co.
Cole Mfg. Co., R. D.
Franklin Process Co.

HOSIERY FORMS.
(See Drying Forms.)

HOSIERY YARNS.
(See Yarn Manufacturers.)

HOSPITAL EQUIPMENT AND SUPPLIES.
Estes Surgical Supply Co.

HOTELS.
Hotel Cecil.
Hotel Claridge.
Hotel Martinique.
Hotel Sinton.
Hotel Tuller.

HUMIDIFYING APPARATUS.
American Moistening Co.
Bayley Mfg. Co.
Carrier Eng. Corp.
Grinnell Co.
Parks-Cramer Co.

HUMIDITY INDICATING INSTRUMENTS.
Foxboro Co.
Powers Regulator Co.
Taylor Inst. Co.

HYDROMETERS.
Taylor Instrument Co.

HYDGRODEIKS.
Taylor Instrument Co.

HYDRAULIC TURBINES.
(See Turbines—Hydraulic.)

HYDRO EXTRACTORS.
(See Extractors.)

ICE MACHINES.
Miles Refrigerating Co.
Southern Ice Machine Co.

ILLUMINATING ENGINEERS.
Curtis, Paul W.
Huntington & Guerry.
Ivanhoe-Regent Works.

INDICATING AND RECORDING INSTRUMENTS AND THERMOMETERS.
Foxboro Co., Inc.
General Electric Co.
Powers Regulator Co.
Taylor Instrument Co.

INDIGO.
(See Dyestuffs and Chemicals.)

INDICATORS FOR ROVING CANS.
O'Malley & Carroll.

INDUSTRIAL SITES.
Alabama Power Co.
Georgia Ry. & Power Co.
Nashville Industrial Corp.
Texas & Pacific Ry.

INJECTORS.
Lunkenheimer Co.

INK—STENCIL AND MARKING.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

IRON WORK—ORNAMENTAL.
Anchor Post Iron Works.
Chicago Bridge & Iron Wks.
Dufur & Co.
Knapp Fence Co.
Lombard Iron Works & Supply Co.

JACK SPOOLS.
(See Spools.)

JACQUARDS.
Crompton & Knowles Loom Works.

JOINT COMPOUND.
Dixon Crucible Co., Jos.

JUTE BAGGING MACHINE.
Smith & Furbush Machine Co.

KETTLES—SIZE.
(See Size Kettles.)

KETTLES—SODA.
Chicago Bridge & Iron Wks.
Lombard Iron Works & Supply Co.

KIERS.
(See Bleaching Kiers.)

KNIT GOODS.
(See Cotton Cloth Commission Merchants and Dealers.)

KNIT GOODS WASHERS.
(See Washers—Cloth.)

KNITTING MACHINERY AND SUPPLIES.
Brinton Co., H.
General Machine Works.
Hemphill Mfg. Co.
Scott & Williams.
Trump Bros. Machine Co.
Wildman Mfg. Co.

LABORATORY INSTRUMENTS AND THERMOMETERS.
Estes Surgical Supply Co.
Taylor Instrument Co.

LACING—BELT.
(See Belt Lacing.)

LAMPS—INCANDESCENT AND ARC.
Carter Electric Co.
Curtis, Paul W.
Cutter Works, George.
General Electric Co.
Ivanhoe-Regent Works of G. E. Co.
Walraven Co.
Westinghouse Elec. & Mfg. Co.

LAMP GUARDS—KEY LOCKING.
(See Electric Lamp Guards.)

LAMP REFLECTORS.
Carter Electric Co.
Curtis, Paul W.
Cutter Works, George.
Ivanhoe-Regent Works of G. E. Co.
Westinghouse Elec. & Mfg. Co.

LANDSCAPE ARCHITECTS.
(See Village Architects.)

LAPPERS.
Brooks & Doxey, Ltd.
Lord Bros.
Saco-Lowell Shops.
Smith & Furbush Mch. Co.
Whitin Machine Works.

LAUNDRY MACHINERY.
American Laundry Mchry. Co.
Fletcher Works.
Hunt Machine Co., Rodney.
Schaum & Uhlinger.
Tolhurst Machine Works.

LAVATORIES.
Crane Co.
Vogel Co., Jos. A.

LEATHER BELTING.
(See Belting.)

LEATHER SPECIALTIES.
American Supply Co.
Bond Co., Chas.
Jacobs Mfg. Co., E. H.
Williams & Sons, I. B.

LIGHTS—FLOOD.
Cutter Works, George.
General Electric Co.
Ivanhoe-Regent Works.
Westinghouse Elec. & Mfg. Co.

LIGHTING ENGINEERS AND CONTRACTORS.
(See Illuminating Engineers.)

LINEN YARNS.
(See Yarns—Linen.)

LINK BELTING.
(See Belting—Link.)

LINTERS.
(See Waste Dealers.)

LIQUID CHLORINE.
(See Chlorine.)

LOADERS—WAGON AND TRUCK.
Link-Belt Company.

LOCKERS—METAL.
Collins, J. D.
Lupton Sons Co., David.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

LOGWOOD EXTRACT.
(See Dyestuffs and Chemicals.)

LOOMS.
Crompton & Knowles Loom Works.
Draper Corporation.
Fletcher Works.
Saco-Lowell Shops.
Schaum & Uhlinger.
Stafford Co.
Textile Service & Equip. Co.

LOOM ATTACHMENTS—AUTOMATIC.
Draper Corporation.

LOOM HARNESS.
(See Harness.)

LUBRICANTS.
D-A Lubricant Co.
Dixon Crucible Co., Jos.
Lamson Oil Co., Inc.
Masury-Young Co.
Moore Oil Refining Co.
N. Y. & N. J. Lubricant Co.
Texas Co.

LUBRICATORS.
Bowser & Co., S. F.
Lidseen.
N. Y. & N. J. Lubricant Co.

LUG STRAPS.
(See Straps—Lug.)

LUMBER.
Cornell Wood Products Co.
Rose Bros.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.

LUNCH ROOM EQUIPMENT.
(See Restaurant.)

MACHINE TOOLS.
(See Tools.)

MACHINISTS.
Briggs-Shaffner Co.
Cole Mfg. Co., R. D.
Cresson-Morris Co.
Lombard Fdry. & Mch. Works.

MARKET SERVICE.
Textile Service & Equip. Co.

MARKING POTS, STENCILS, INKS, ETC.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

MERCERIZED YARNS.
(See Yarn Manufacturers).

MERCERIZERS.
Aberfoyle Mfg. Co.
Amer. Yarn & Processing Co.
Boger & Crawford.
Dixie Mercerizing Co.

MERCERIZED YARN.
Aberfoyle Mfg. Co.
American Yarn & Pro. Co.
Boger & Crawford Co.
Dixie Mercerizing Co.
Hunter Mfg. & Comm. Co.

MERCERIZING MACHINERY.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

METAL CEILINGS, ETC.
Lupton's Sons Co., David.

METALS—PERFORATED.
(See Screens and Sieves.)

METERS—FLOW, AIR, GAS, ELECTRIC, STEAM, ETC.
Allis-Chalmers Mfg. Co.
Carter Electric Co.
Foxboro Co., Inc.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

METERS—COUNTING.
(See Counters.)

MILL BASKETS AND BOXES.
(See Boxes—Mill.)

MILL ENGINEER.
(See Architects and Engineers.)

MILL VILLAGES.
(See Villages.)

MILL SUPPLIES—MISCELLANEOUS.
(See Supplies—Mill.)

MILL WHITE PAINT.
(See Paint.)

MOPS.
Atlanta Brush Co.
Southwestern Broom Mfg. Co.

MOTION PICTURES.
(See Films.)

MOTORS AND GENERATORS—ELECTRIC.
Allis-Chalmers Mfg. Co.
Carter Electric Co.
Curtis, Paul W.
General Electric Co.
Nashville Industrial Corp.
Walraven Co., The.
Westinghouse Elec. & Mfg. Co.

MOVING PICTURE MCH. AND SUPPLIES.
(See Theatre Equipment or Films).

NAPPERS.
Roy & Son Co., B. S.

OFFICE EQUIPMENT & SUPPLIES.
Byrd Printing Co.
Dowman-Wilkins Ptg. Co.
Carter Electric Co.
Knapp Fence Co.
Lupton's Sons Co., David.
Monroe Calculating Mch. Co.
Smith & Bros. Typewriter Co.
Sanymetal Products Co.

OFFICE PARTITIONS.
Knapp Fence Co.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

OIL—LUBRICATING.
D-A Lubricant Co.
Johnson & Co., Inc., Oliver.
Lamson Oil Co., Inc.
Masury-Young Co.
Moore Oil Refining Co.
Texas Co.
Wadsworth, Howland & Co., Inc.

OIL ENGINES.
(See Engine Oil.)

OIL FILTERS.
Burt Mfg. Co.

OILS—FINISHING.
(See Finishing and Sizing Materials.)

OIL CANS.
Lidseen.

OIL CUPS.
(See Lubricators.)

OIL PAPER.
Bradley Mfg. Co., A. J.

OIL STORAGE TANKS AND PUMPS.
Bowser & Co., S. F.

OILING DEVICES.
(See Lubricators.)

OPENERS FOR COTTON, WOOL, WASTE, ETC.
Brooks & Doxey, Ltd.
Lord Bros.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.

OVERHEAD CARRIERS.
Chisholm-Moore Mfg. Co.
Curtis Pneumatic Mchry. Co.

OXIDIZING MACHINERY.
Cocker Mch. & Fdry. Co.
Phila. Drying Machinery Co.

OXYGEN.
Bird-Potts Co., Inc.
Commercial Acetylene Supply Co.
Oxweld Acetylene Co.
Standard Gas Products Co.

PACKING BOXES AND CASES—WOODEN.
Hauser-Stander Tank Co.
Hightower Box & Tank Co.
Lewis Co., G. B.
Walke Box Co., Inc.

PACKINGS.
Jenkins Bros.
Walraven Co.

PAINT.
American Cement Paint Co.
Barrett Co., The.
Dixon Crucible Co., Jos.
Du Pont de Nemours & Co., E. I.
Johnson & Co., Oliver.
Wadsworth, Howland & Co., Inc.

PAINTING CONTRACTORS.
(See Contractors.)

PANEL BOARDS.
(See Switchboards.)

PAPER.
Bradley Mfg. Co., A. J.

PARTITIONS—STEEL AND WIRE.
Knapp Fence Co.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

PERBORATE OF SODA.
Roessler & Hasslacher Chemical Co.

PERFORATED METAL.
(See Screens and Sieves.)

PEROXIDES.
Roessler & Hasslacher Chemical Co.

PICKERS—CURLED HAIR.
Schofield Co., Wm.
Smith & Furbush Machine Co.

PICKERS—LEATHER.
Bond Co., Chas.
Garland Mfg. Co.

PICKER STICKS.
Garland Mfg. Co.
Southern Bending Co.
Walraven Co.

PICKING MACHINERY.
Brooks & Doxey, Ltd.
Howard & Bullough Am. Machine Co.
Lord Bros.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.

PINIONS.
General Electric Co.

PIPE AND PIPE FITTINGS.
Crane Co.
East Jersey Pipe Co.
Grinnell Co.
Parks-Cramer Co.
Scaife & Sons Co., Wm. B.
Walraven Co.

PIPE DRAINAGE.
Dixie Culvert & Metal Co.

PIPE JOINT COMPOUND.
Dixon Crucible Co., Jos.

PIPE THREADING AND CUTTING MACHINES.
Oster Mfg. Co.
Walraven Co., The.

PIPING ENGINEERS.
Grinnell Co.

PIPE BENDING.
Grinnell Co.

PIPING (POWER & PROCESS).
Grinnell Co.

PLAYGROUND APPARATUS & EQUIPMENT.
Crane Co.
Rundle-Spence Mfg. Co.
Taylor, Halsey W.

PNEUMATIC MACHINERY & TOOLS.
Curtis Pneumatic Mchry. Co

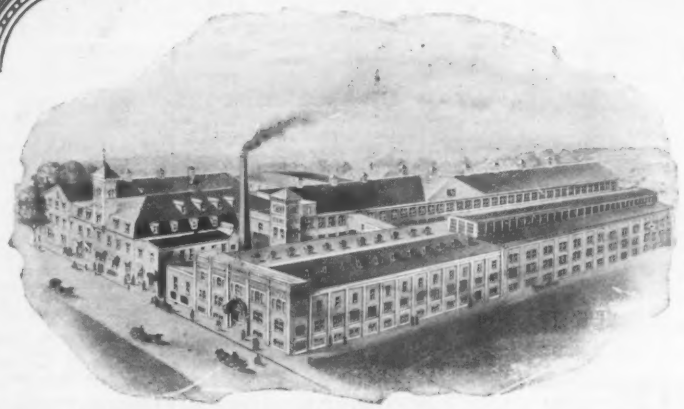
PORTABLE CONVEYORS.
(See Conveyor.)

POSTS—FENCE (WOOD).
Southern Wood Preserving Co.

POWER—ELECTRIC.
Alabama Power Co.
Georgia Ry. & Power Co.

POWER TRANSMISSION.
Aldrich Machine Works.
Allis-Chalmers Mfg. Co.
Bond Co., Chas.
Brown Co., A. & F.
Carlyle-Johnson Mch. Co.
Columbia Novelty Mfg. Co.
Cresson-Morris Co.
Dixon Crucible Co., Jos.
Fabreeka Belting Co.
Fafnir Bearing Co.
Flexible Steel Lacing Co.
General Electric Co.
Grinnell Co.
Hyatt Roller Bearing Co.
Link-Belt Company.
Morse Chain Co.
Skayef Ball Bearing Co.
U. S. Ball Bearing Co.
Walraven Co., The.
Westinghouse Elec. & Mfg. Co.
Williams & Sons, I. B.
Wood's Sons Co., T. B.

PRESERVATIVE PAINT FOR METAL WORK.
(See Paints.)



COTTON HARNESS for all kinds of Plain and Fancy Weaves in Cotton and Silk Goods.
MAIL HARNESS for Cotton Duck, including Tire Duck, Worsted and Silk Goods.
SELVEDGE HARNESS any depth up to 24 inches, for Weaving Tape Selvedges.
REEDS for Cotton, Woolen, Silk and Duck.
Slasher and Striking Combs, Warper and Leice Reeds, Beamer and Dresser Hecks.
Mending Eyes, Jacquard Heddles.
We make a specialty of equipping harnesses for the Drawing-In Machines.

Satisfied Customers

are an indication of

Satisfactory Products

We make a special endeavor to give our customers entire satisfaction.

Quality, Service and Satisfaction alone are responsible for our large volume of sales.

We can meet your requirements. Write us for prices on your needs.

Southern Representative
Geo. F. Bahan

EMMONS LOOM HARNESS CO.,
LAWRENCE, MASS.

SOLE AGENTS FOR WARDWELL PICKERS.

The Largest Manufacturers of Loom Harness and Reeds in America.

EMMONS LOOM HARNESS AND REEDS

"REMOVOIL"

The Perfected Oil-Stain Remover

A few drops of "Removoil" on an oil spot, and a little rubbing instantly removes it from the finest fabric. If the goods are going direct to the bleachery, no rubbing is necessary;—just drop a little "Removoil" on the stain, and you no longer need to worry about it.

"Removoil" reduces seconds to the minimum.

White goods mills all over the country are using "Removoil today.

Let us add your name to our list of satisfied users.

Write for full information.

"Our Success Represents Confidence Won by Integrity."

MASURY-YOUNG CO.

Established 1857. **Boston, Mass.**

GEORGE F. BAHAN, Southern Representative

BUYERS' INDEX—Continued.

PRESSED STEEL.
Lupton's Sons Co., David.

PRESSES.
American Laundry. Mchry. Co.
Butterworth & Sons Co., H. W.
Economy Baler Co.
Famous Mfg. Co.
Phila. Drying Mch. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co., The.

PRESSURE REGULATORS.
(See Regulators—Pressure.)

PRINTING.
Byrd Printing Co.
Dowman Wilkins Printing Co.
Showalter Printing Co., A. J.

PULLEYS.
Brown Co., A. & F.
Cole Mfg. Co., R. D.
Dodge Sales & Eng. Co.
Cresson-Morris Co.
Link-Belt Company.
Mason, Volney W.
Walraven Co., The.
Wood's Sons Co., T. B.

PULLEY COVERING.
Williams & Sons, I. B.

PUMPS.
Allis-Chalmers Mfg. Co.
Bowser & Co., S. F.
Goulds Mfg. Co.
Sydnor Pump & Well Co., Inc.
Toomey, Frank.
U. S. & Cuban Allied Works, Eng'g Corp.
Walraven Co.
Walsh & Weidner Boiler Co., The.
Westinghouse Elec. & Mfg. Co.

PUMPS—OIL.
Bowser & Co., S. F.
Lunkenheimer Co.

PUMP VALVES.
(See Valve Discs.)

PYROMETERS.
Foxboro Co.
Taylor Instrument Co.

QUILLS.
Jordan Mfg. Co.

QUILL CLEANING MACHINES.
Terrell Machine Co.

RAILWAYS.
A. B. & A. Ry.
A. & W. P. Ry.
Georgia Railroad.
Southern Railway System.
Texas & Pacific Ry.

RAW STOCK DRYING SYSTEMS.
Brandwood, John.

RECEPTACLES—FIBRE.
(See Fibre Products.)

RECORDING INSTRUMENTS.
Foxboro Co., Inc.
General Electric Co.
Powers Regulator Co.
Taylor Instrument Co.

REEDS.
American Supply Co.
Atlanta Harness & Reed Mfg. Co.
Emmons Loom Harness Co.
Walraven Co.

REELS.
Cocker Mch. & Fdry. Co.
Crompton & Knowes Loom Works.
Draper Corporation.
Gallaudet Aircraft Corporation.
Hunt Machine Co., Rodney.
Mossberg Pressed Steel Co.
Saco-Lowell Shops.
Schofield Co., Wm.
Whitin Machine Works.

REFLECTORS—LAMP.
(See Lamp Reflectors.)

REGULATORS—LIQUID LEVEL.
Foxboro Co., Inc.
General Electric Co.
Powers Regulator Co.

REGULATORS—PRESSURE.
Foxboro Co., Inc.
General Electric Co.
Powers Regulator Co.
Taylor Instrument Co.

REGULATORS—TEMPERATURE.
(See Temperature Controllers.)

REINFORCING SLAG.
Birmingham Slag Co.

REPAIRING—ELECTRICAL.
Briggs-Shaffner Co.
Curtis, Paul W.
Westinghouse Elec. & Mfg. Co.

REPAIRING—TEXTILE MACHINERY, ETC.
Bird-Potts Co., Inc.
Briggs-Shaffner Co.
General Machine Works.
Southern Spindle & Flyer Co.
Standard Gas Products Co.

RESTAURANT EQUIPMENT.
Sanymetal Products Co.

RIBBERS.
(See Knitting Machinery.)

RIB TOP CUTTERS.
General Machine Works.
Wildman Mfg. Co.

RING TRAVELERS—STEEL AND BRONZE.
Whitinsville Spinning Ring Co.
Whitin Machine Works.

RINGS—SPINNING.
(See Spinning Rings.)

ROCKER SHAFT BEARINGS.
(See Bearings.)

ROLLS—CALENDER.
Brooks & Doxey, Ltd.
Butterworth & Sons Co., H. W.
Lord Bros.
Roy & Son Co., B. S.
Textile Finishing Mchry. Co.

ROLLS—RUBBER COVERED.
Butterworth & Sons Co., H. W.
Textile Finishing Mchry. Co.

ROLLS—STEEL.
Brooks & Doxey, Ltd.
Butterworth & Sons Co., H. W.
Lord Bros.
Southern Spindle & Flyer Co.
Textile Finishing Mchry Co.

ROLLER CLOTH.
Philadelphia Felt Co.

ROLLER LEATHER.
Bond & Co., Chas.

ROLL WASTE PACKERS.
Belger Co.

ROOFING.
Barrett Co., The.
Cortright Metal Roofing Co.
Southern Wood Preserving Co.
Wadsworth, Howland & Co.
Walraven Co.

ROOF AND CEMENT COATING.
American Cement Paint Co.
Barrett Co.
Du Pont de Nemours & Co., E. I.
Johnson & Co., Inc., Oliver.
Wadsworth, Howland & Co.

ROPE—TRANSMISSION.
Allis-Chalmers Mfg. Co.
Brown Co., A. & F.
Cresson-Morris Co.
Link-Belt Company.
Walraven Co.

ROPE SHEAVES.
Brown Co., A. & F.

ROVING CANS.
(See Cans—Roving.)

ROVING CAN INDICATORS.
O'Malley & Carroll.

ROVING MACHINERY.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Whitin Machine Works.

RUBBER GOODS.
Estes Surgical Supply Co.

RUBBER STAMPS.
(See Stamps, Stencils, Etc.)

SALAMANDERS.
Drouve Co., G.

SANITARY PRODUCTS.
Crane Co.
Dixie Culvert & Metal Co.
Estes Surgical Supply Co.
Rundle-Spence Mfg. Co.
Sanitas Co.
Sanymetal Products Co.
Taylor, Halsey W.
Vogel Co., Jos. A.

SASH-WINDOW—STEEL.
Drouve Co., G.
Lupton's Sons Co., David.
Sanymetal Products Co.

SASH OPERATOR.
Drouve Co., G.

SCALE PREVENTER—BOILER.
(See Boiler Feed Water Purification.)

SCREENS—MOVING PICTURE.
Southern Theatre Equip. Co.

SCREENS AND SIEVES—PERFORATED.
Allis-Chalmers Mfg. Co.
Erdle Perforating Co.
Link-Belt Company.

SCOURING MACHINERY.
(See Washers—Cloth.)

SCRUBBING MACHINE—FLOOR.
American Scrubbing Mch. Co.

SCRUBBING AND WASHING POWDERS.
India Alkali Works.
Warren Soap Mfg. Co.

SCUTCHERS.
Brooks & Doxey, Ltd.
Lord Bros.
Whitin Machine Works.

SECOND HAND MACHINERY AND SUPPLIES
Nashville Industrial Corp.
Rose Bros.
Textile Service & Equip. Co.
Toomey, Frank, Inc.
Walraven Co.

SELVAGE HARNESS.
(See Harness.)

SEWING MACHINES.
Merrow Machine Co., The.
Textile Finishing Mchry. Co.

SHADES—ELECTRIC LAMP.
(See Reflectors.)

SHADES (WINDOW).
Hough Shade Corp.

SHAFTING AND HANGERS.
Allis-Chalmers Mfg. Co.
Brown Co., A. & F.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Fafnir Bearing Co.
Grinnell Co.
Link-Belt Co.
Skayef Ball Bearing Co.
Walraven Co., The.
Wood's Sons Co., T. B.

SHEARS.
Roy & Sons Co., B. S.

SHELVING—SECTIONAL STEEL.
Collins, J. D.
Hyatt Roller Bearing Co.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

SHINGLES—ASPHALT.
Barrett Co.

SHINGLES—METAL.
Cortright Metal Roofing Co.

SHINGLES—WOOD.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.

SHIPPING ROOM MACHINERY AND SUPPLIES.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Collins, J. D.
Hauser-Stander Tank Co.
Hightower Box & Tank Co.
Lewis Co., G. B.
Lyon Metallic Mfg. Co.
Standard Fibre Co.
Walraven Co., The.
Walke Box Co., Inc.

SHOWER BATHS AND CABINETS.
Crane Co.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

SHUTTLES.
Crompton & Knowles Loom Works.
Draper Corporation.
Jordan Mfg. Co.
Shambow Shuttle Co.
Southern Bending Co.
Walraven Co.
Williams Co., J. H.

SICK ROOM SUPPLIES.
Estes Surgical Supply Co.

SIGNS—ELECTRIC.
Federal Electric Co.

SINGEING MACHINERY.
Butterworth & Sons Co., H. W.
Phila. Drying Machine Co.
Textile Finishing Machinery Co., The.

SIREN.
Brown Co., A. & F.
Federal Electric Co.

SITES FOR FACTORIES.
(See Industrial Sites.)

SIZE BOX TEMPERATURE CONTROLLER.
Foxboro Co.
Powers Regulator Co.

SIZE KETTLES.
Butterworth & Sons Co., H. W.
Hauser-Stander Tank Co.
Howard & Bullough American Machine Co.
Lombard Iron Wks. & Sup. Co.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.

SIZING AND FINISHING COMPOUNDS.
(See Finishing and Sizing Materials.)

SKEWERS.
Jordan Mfg. Co.

SKYLIGHTS.
Drouve Co., G.
Lupton's Sons Co., David.

SKYLIGHT GUARDS.
Knapp Fence Co.

SLAG FOR CONCRETE.
Birmingham Slag Co.

SLASHERS AND SLASHER ROOM SUPPLIES.
Butterworth & Sons Co., H. W.
Cocker Mch. & Fdry. Co.
Cole Mfg. Co., R. D.
Howard & Bullough.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.

SLASHER CLOTH.
Philadelphia Felt Co.

SLASHER HOODS.
Cole Mfg Co., R. D.

SLASHER TAPE.
(See Tape—Slasher.)

SLATE ASPHALT ROOFING.
Barrett Co.

SLIDING PARTITION HARDWARE.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

SLUBBERS.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Whitin Machine Works.

SOAP—TEXTILE.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Ciba Co., Inc.
Du Pont de Nemours & Co., E. I.
Electric Smelting & Aluminum Co.
India Alkali Wks.
Kali Mfg. Co.
Mates-Brown Co., Inc., B. P.
Newport Chemical Works.
Sonneborn Sons, Inc., L.
Stearns, Wm. Taylor.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.

SODA—TEXTILE. SODA ASH AND BOILING.
Sonneborn Sons, Inc., L.

SOFTENERS—COTTON.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Bosson & Lane.
Ciba Co., Inc.
Du Pont de Nemours & Co., E. I.
Ford Co., J. B.
Grasselli Chemical Co.
Kali Mfg. Co.
Mates-Brown Co., Inc., B. P.
Moore Oil Refining Co.
Newport Chemical Works.
Roessler & Hasslacher Chemical Co.
Sonneborn Sons, Inc., L.
United Chemical Prod. Corp.
Wolf & Co., Jacques.

SOFTENERS—WATER.
(See Water Softeners.)

SOLDERLESS CONNECTORS—FRANKEL.
Westinghouse Elec. & Mfg. Co.

SOLOZONE.
Roessler & Hasslacher Chem. Co.

SOLVENTS.
(See Finishing.)

SPEEDERS.
Jordan Mfg. Co.
Vermont Spool & Bobbin oC.

SPEEDOMETERS.
(See Counters.)

SPINDLES.
Draper Corporation.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Vermont Spool & Bobbin Co.
Whitin Machine Works.

SPINNERS.
Aberfoyle Mfg. Co.
Amer. Yarn & Processing Co
Arkray Mills, Inc.
Arlington Cotton Mills.
Arrow Mills, Inc.
Boger & Crawford.
Flint Mfg. Co.
Fletcher Works.
Florsheim, H. A.
Gray Mfg. Co.
Hunter Mfg. & Comm. Co.
Myrtle Mills, Inc.
Philadelphia Felt Co.
Parkdale Mills, Inc.

SPINNING FRAMES.
American Machine Co., H. & B.
Crompton & Knowles Loom Works.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Schaum & Uhlinger.
Saco-Lowell Shops.
Whitin Machine Works.

SPINNING RINGS.
Brooks & Doxey, Ltd.
Draper Corporation.
Howard & Bullough.
Greist Mfg. Co.
Lord Bros.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

SPINNING TAPE SPECIALISTS.
American Textile Banding Co., Inc.
Barber Mfg. Co.

SPOOLING MACHINERY AND SUPPLIES.
Draper Corporation.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Whitin Machine Works.

SPOOLER TENSIONING DEVICE.
Textile Specialty Co.

SPOOLS AND SKEWERS.
Jordan Mfg. Co.
Lestershire Spool & Mfg. Co
Mossberg Pressed Steel Corp'n.
Vermont Spool & Bobbin Co.
Walraven Co.

SPRINKLER SYSTEMS.
Grinnell Co.

SPRINKLER TANKS.
(See Tanks, Towers, Etc.)

SPROCKETS.
Link-Belt Company.
Morse Chain Co.

SPUR CAP SHELLS.
Gallaudet Aircraft Corporation.

STAMPS, STENCILS AND STENCIL MACHINES.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

STAND PIPES.
(See Tanks, Towers, Etc.)

STARCH AND GUMS.
(See Finishing and Sizing Materials.)

STEAM ENGINES.
(See Engines—Steam.)

STEAM HOSE.
(See Hose—Fire.)

STEAM PUMPS.
(See Pumps—Steam.)

STEAM TRAPS.
(See Traps—Steam.)

STEEL SHELVING, DOORS, WINDOW PARTITIONS, ETC.
Collins, J. D.
Lupton & Sons Co., David.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

ESSCO

ESTES SURGICAL SUPPLY CO.

16 N. FORSYTH ST., ATLANTA, GA.

Be prepared for an accident, let us equip you for a first aid room. Textile First Aid Cabinets.

Physicians', Surgeons' and Hospital Supplies, Elastic Stockings, Trusses, Crutches and Abdominal Belts.

WHOLESALE DRUGS.

Write, wire or phone us.

Long Distance Phones, Ivy 1700 and Ivy 1701.

We are in position to send an expert to furnish estimate on equipments.

BRING your steam drainage problems to the attention of steam drainage specialists.

Drain your steam heated equipment of all condensation and return it direct to your boilers with the Morehead Back-to-Boiler System.

Morehead Mfg. Co., Detroit, Mich.

(30)

Positively Drains All Types of Steam Apparatus — Delivers Condensation And Feed Water to Boiler Under All Conditions at Maximum Temperature — The "Morehead" Return Trap — Your Fuel Bills are Less

Morehead

"BACK-TO-BOILER-SYSTEM"

ZIG-ZAG STEEL BELT LACING

Only full line of ZIG-ZAG Steel Lacing made

ONLY 8 SIZES

The ZIG-ZAG Principle is the Life of the Joint

STRONG SMOOTH ELASTIC QUICK DURABLE CHEAP

GUARANTEED in ALL KINDS and SIZES of BELTS and over ALL SIZE PULLEYS

MANUFACTURED BY COLUMBIA NOVELTY MFG. CO. ST. LOUIS, U.S.A.

A BETTER LACING FOR LESS MONEY

ELECTRIC WIRING CONTRACTOR

LIGHT POWER

PAUL W. CURTIS

Chattanooga, Tenn.

TEXTILE WORK A SPECIALTY

ALL STEEL ECONOMY FIRE PROOF BALING PRESSES

ALL SIZES FOR ALL PURPOSES

LARGEST LINE BUILT IN U.S.A.

ECONOMY BALER CO., DEPT C ANN ARBOR, MICH., U.S.A.

FAMOUS MANUFACTURING CO.

COTTON
COTTON WASTE
COTTON SEED HULLS
RAGS, PAPER, ETC.
SOUTHERN AGENTS
LOVINGOOD CO. ATLANTA, GA.

MANUFACTURERS OF "FAMOUS" AND "CHAMPION" BALING PRESSES FOR ALL PURPOSES

140 MAIN STREET EAST CHICAGO, IND.

SCRAP METALS
WOOD SHAVINGS
SAW DUST
EXCELSIOR
CURLED HAIR ETC.

Cotton Mills Contemplating BUILDING VILLAGE HOUSES

should get in touch with us at once and secure our prices on Lumber and building supplies. Our materials can be bought at half regular prices.

ROSE BROS. & CO.

CAMP GORDON

Chamblee, Georgia

ALLIGATOR

TRADE MARK REG. U.S. PAT. OFFICE

STEEL BELT LACING

The Strongest Belt Lacing On Earth

BEST for high or low speed; light or heavy duty belts.

Never lets go. Only a hammer to make a perfect joint. Sold by all leading jobbers.

WRITE NOW for valuable hand book "Short Cuts to Power Transmission."

FLEXIBLE STEEL LACING CO.

4619 Lexington Street Chicago, Ill., U. S. A.

135 Finsbury Pavement London, E. C., England

Reg. U. S. Pat. Office

BUYERS' INDEX—Continued.

STENCILS AND STENCIL PAPERS.
(See Stamps and Stencils.)

STENCIL BRUSHES.
(See Marking Pots and Brushes.)

STENCIL CUTTING MACHINES
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

STICKS—PICKER.
(See Picker Sticks..)

STOP MOTION.
Crompton & Knowles Loom Works.
Draper Corporation.
Eclipse Textile Devices, Inc.
Textile Specialty Co.
Whitin Machine Works.
Wildman Mfg. Co.

STOKERS.
Westinghouse Elec. & Mfg. Co.

STORAGE RACKS.
(See Shelving.)

STRAPS (LUG, CHECK, HEEL, TUGGER, PICKER HARNESS, ETC.)
Bond & Co., Chas.
Jacobs Mfg. Co., E. H.
Garland Mfg. Co.

STRAPPING.
(See Leather Specialties or Check Straps.)

STREET LIGHTING FIXTURES.
Cutter Works, George.

SULPHUROUS ACID GENERATOR.
Macomb Machine Co.

SUPPLIES—GENERAL MILL.
Atlanta Harness & Reed Co.
Brown, A. & F.
Jacobs Mfg. Co., E. H.
Jenkins Bros.
Jordan Mfg. Co.
Nashville Industrial Corp.
Steel Heddle Mfg. Co.
Vermont Spool & Bobbin Co.
Walraven Co., The.

SURGICAL SUPPLIES.
Estes Surgical Supply Co.
Taylor Instrument Co.

SWITCHES—KNIFE-ELEC.
Cutter Works, George.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

SWITCHBOARDS—PANEL.
Cutter Co., George
General Electric Co.
Westinghouse Elec. & Mfg. Co.

SYSTEMS (BUSINESS).
Ernst & Ernst.

TABLES, CHAIRS, ETC.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

TALLOW.
(See Finishing Machinery.)

TANKS—OIL, GASOLINE, PAINT, ETC.
Bowser & Co., S. F.

TANKS, TOWERS AND TUBS.
Bowser & Co., S. F.
Chicago Bridge & Iron Wks.
Cole Mfg. Co., R. D.
Grinnell Co.
Hauser-Stander Tank Co.
Highlower Box & Tank Co.
Lombard Iron Works & Supply Co.
Phila. Drying Machinery Co.
Textile Finishing Mchry. Co.,
Walsh & Weidner Boiler Co.

TAPE LOOMS—COTTON.
Fletcher Works.
Schaum & Uhlinger.

TAPES AND BRAIDS.
American Textile Banding Co., Inc.
Barber Mfg. Co.
Weimar Brothers.

TAPES—SPINNING AND TWISTING.
Barber Mfg. Co.

TAPE MAKING MACHINES.
(See Bandage and Tape Machinery.)

TAX SERVICE.
Ernst & Ernst.

TELEPHONE—CALLING SYSTEM.
Carter Electric Co.
General Electric Co.

TEMPERATURE REGULATORS
Carrier Eng. Corp.
Foxboro Co., Inc.
General Electric Co.
Parks-Cramer Co.
Powers Regulator Co.
Taylor Instrument Co.

TEMPLES.
Draper Corporation.

TENTERS.
Butterworth & Sons Co., The.
Textile Finishing Mach. Co.

TENTER FRAME GUIDER—ELECTRIC.
Blake Electric Mfg. Co.

TENSION DEVICE FOR SPOOLERS.
Textile Specialty Co.

TENTER HOUSING & RECONSTRUCTING SYSTEM.
Proctor & Schwartz, Inc.

TEXTILE MACHINERY.
(See Cotton Mill Machinery.)

THEATRE EQUIPMENT.
Southern Theatre Equip. Co.

THERMOMETERS—ANGLE AND STRAIGHT STEM.
Foxboro Co.
Taylor Instrument Co.

THERMOMETERS—RECORDING AND INDEX.
Foxboro Co.
Taylor Instrument Co.

THERMOSTATS.
Foxboro Co.
Powers Regulator Co.

THIN PLACE PREVENTERS.
Draper Corporation.

THREAD EXTRACTORS.
Brooks & Doxey, Ltd.
Lord Bros.

THREAD GUIDES.
Palmer Co., The I. E.
Textile Specialty Co.

TIME CLOCKS.
(See Clocks.)

TIERING MACHINES.
Collins, J. D.

TIES—BALING.
(See Bale Ties.)

TIRE FABRIC EQUIPMENT.
Textile Service & Equip. Co.

TOILETS.
Crane Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

TOILET PARTITIONS.
Lupton's Sons Co., David.
Sanymetal Products Co.

TOOL CABINETS—STEEL.
Lupton's Sons Co., David.

TOOL STANDS—STEEL.
Lupton's Sons Co., David.

TOOLS—ALL KINDS.
Walraven Co., The.

TOWERS.
(See Tanks and Towers.)

TRACTORS—ELECTRIC, INDUSTRIAL.
Collins, J. D.

TRANSMISSION—POWER.
(See Power Transmission Machinery.)

TRAPS—RETURN STEAM.
Morehead Mfg. Co.

TROLLEYS & HOISTS.
Chisholm-Moore Mfg. Co.
Curtis Pneumatic Mchry. Co.

TRUCKS—AUTO.
Packard Motor Car Co.
White Co.

TRUCKS, BASKETS, ETC.
Lewis Co., G. B.
Lyon Metallic Mfg. Co
Standard Fibre Co.

TRUCKS—ELECTRIC—INTER.
Collins, J. D.

TRUCKS—HAND AND ELEVATING.
Collins, J. D.

TRUCKS—INTER, ETC.
Lewis Co., G. B.
Lyon Metallic Mfg. Co.
Standard Fibre Co.

TRUSSES AND ABDOMINAL BELTS.
Estes Surgical Supply Co.

TUBS.
(See Tanks.)

TURBINES—HYDRAULIC.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

TURBINE—STEAM.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

TWISTING MACHINERY AND SUPPLIES.
Barber Mfg. Co.
Draper Corporation.
Howard & Bullough.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Whitin Machine Works.

TYPEWRITERS
Smith & Bros. Typewriter Co.

URINALS.
Crane Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

UNIONS—BRONZE.
Crane Co.
Jenkins Bros.

VACUUM PANS.
Cresson-Morris Co.

VALVES—ANGLE, GLOBE, CROSS, BLOW-OFF, CHECK, GATE, POP-SAFETY, ETC.
Crane Co.
Grinnell Co.
Jenkins Bros.
Walraven Co.

VALVES—FOOT.
Brown & Co., A. & F.

VALVES—NON-RETURN STOP.
Crane Co.
Jenkins Bros.
Walraven Co.

VARNISHES.
Barrett Co.
Du Pont de Nemours & Co., E. I.
Johnson & Co., Inc., Oliver.
Wadsworth, Howland & Co., Inc.

VATS.
(See Tanks.)

VENTILATING APPARATUS.
Bayley Mfg. Co
Buckeye Blower Co.
Burt Mfg. Co.
Carrier Eng. Corp.
Drouve Co., G.
General Electric Co.
Grinnell Co.
Hough Shade Corp.
Parks-Cramer Co.
Sargent's Sons Co., C. G.
Tolhurst Machine Co.

VENTILATING WINDOW SHADES.
Hough Shade Corp.

VILLAGE ARCHITECTS AND DESIGNERS.
Robert & Co.
Sirrine, J. E.
Sniker & Lose.
Stubbman, Edw. A.

VILLAGE HOUSES.
(See Houses—Ready-Built.)

WAGON AND CAR UNLOADERS.
Curtis Pneumatic Mchry. Co.

WALL BOARD.
Cornell Wood Products Co.

WAREHOUSE—PORTABLE.
(See Buildings.)

WAREHOUSE DOOR HARDWARE.
(See Doors and Hardware.)

WAREHOUSE TRUCKS.
(See Trucks.)

WARP DRAWING MACHINE.
Cocker Machine & Fdry. Co.
Crompton & Knowles Loom Works.

WARPERS AND WARPING MACHINERY AND SUPPLIES.
Brandwood, John.
Brooks & Doxey, Ltd.
Cocker Mch. & Fdry. Co.
Draper Corporation.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.

WASH BASINS.
(See Lavatories.)

WASHERS—CLOTH.
American Laundry Mchry. Co
Butterworth & Sons Co., H. W.
Cocker Mch. & Fdry. Co.
Hunt Machint Co., Rodney.
Klauder-Weldon Dyeing Mch. Co
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Mchry. Co.
Tolhurst Mch. Wks.

WASHING POWDERS—FLOOR.
India Alkali Works.

WASTE BINS—STEEL.
Lupton's Sons Co., David.

WASTE MACHINERY—COTTON.
Brooks & Doxey, Ltd.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Sargent's Sons Corp., C. G.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Co.

WATCHMAN CLOCKS.
(See Clocks—Watchman.)

WATER COOLERS—FOUNTAIN.
Crane Co.
Miles Refrigerating Co.
Rundle-Spence Mfg. Co.
Southern Ice Machine Co.
Taylor, Halsey W.

WATER SOFTENERS AND PURIFIERS.
American Water Softener Co.
Norwood Engineering Co.
Scaife & Sons Co., Wm. B.

WATER SUPPLY SYSTEM.
Sydnor Pump & Well Co., Inc.

WATER TOWERS.
(See Tanks and Towers.)

WATERPROOFING MACHINERY.
Butterworth & Sons Co., H. W.
Textile Finishing Machinery Co., The.

WEAVING.
(See Yarn Manufacturers.

WELDING APPARATUS—ELECTRIC ARC.
Bird-Potts Co., Inc.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

WELDING APPARATUS AND SUPPLIES—OXY-ACETYLENE.
Bird-Potts Co., Inc.
Commercial Acetylene Supply Co.
Oxweld Acetylene Co.
Standard Gas Products Co.

WELDING—JOB.
Bird-Potts Co., Inc.
Briggs-Shaffner Co.
Grinnell Co.
Standard Gas Products Co.

WELFARE ARCHITECTS.
(See Village Architects.)

WELFARE EQUIPMENT.
American Laundry Mchry. Co.
Cornell Wood Products Co.
Crane Co.
Cutter Works, George.
Dixie Culvert & Metal Co.
Estes Surgical Supply Co.
Rundle-Spence Mfg. Co.
Sanitas Co.
Southern Theatre Equip. Co.
Taylor, Halsey W.
Westinghouse Elec. & Mfg. Co.

WELL DRILLING.
Sydnor Pump & Well Co., Inc.

WHEELS—FIBRE.
(See Fibre Products.)

WHEEL PULLER.
General Electric Co.

WHIP HOISTS.
Mason, Volney W.

WHISTLES—STEAM AND AIR.
Brown Co., A. & F.
Crane Co.
Jenkins Bros.

WHISTLES—ELECTRIC SIREN.
Federal Electric Co.

WHIZZERS.
East Jersey Pipe Co
Fletcher Works.
Tolhurst Mach. Wks
U. S. & Cuban Allied Works Eng'g Corp.

WINDERS.
Brooks & Doxey, Ltd.
Firsching, J. A.
Howard & Bullough American Machine Co.
Lord Bros.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Universal Winding Co.

WINDOW FRAMES AND SASH—STEEL.
Drouve Co., G.
Lupton's Sons Co., David.

WINDOW GUARDS.
Knapp Fence Co.

WINDOW SASH—STEEL.
Drouve Co., G.
Lupton's Sons Co., David.

WINDOW SHADES.
Hough Shade Corp.

WIRES—DROP.
(See Drop Wires.)

WIRE HEDDLES.
(See Heddles.)

WIRING CONDUITS AND FITTINGS.
(See Electric Machinery and Supplies.)

WIRING—ELECTRICAL.
(See Electrical Contractors.)

WIRE PARTITIONS AND GUARDS.
Knapp Fence Co.

WOOD.
(See Lumber.)

WOOD BOARD PANELS FOR WALLS AND CEILINGS.
Cornell Wood Products Co.

WOOD BLOCK FLOORING.
Southern Wood Preserving Co.

WOOD BOXES.
(See Packing Cases.

WOOD PRESERVER.
American Cement Paint Co.
Barrett Co.
Dixon Crucible Co., Jos.
Du Pont de Nemours & Co., E. I.
Johnson & Co., Inc., Oliver.
Wadsworth, Howland & Co., Inc.

WOOD PULLEYS.
(See Pulleys.)

WOOLEN MACHINERY.
Butterworth & Sons Co., H. W.
Crompton & Knowles Loom Works.
Schofield Co., Wm.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Smith & Furbush Mach. Co.
Textile Finishing Mchry. Co.
Whitin Machine Works.

YARN MANUFACTURERS.
Aberfoyle Mfg. Co
American Yarn & Processing Co.
Arkray Mills, Inc.
Arlington Cotton Mills.
Arrow Mills, Inc.
Boger & Crawford.
Dixie Mercerizing Co.
Flint Mfg. Co.
Florsheim, H. A.
Gray Mfg. Co.
Hunter Mfg. & Comm. Co.
Myrtle Mills, Inc.
Parkdale Mills, Inc.
Philadelphia Felt Co.
Weimar Bros.

YARN DEALERS AND COMMISSION MERCHANTS.
(See Cotton Yarn and Cloth Commission Merchants and Dealers.)

YARN DYERS.
(See Dyers.)

YARN DRYERS.
(See Dryers.)

No Idle Spindles or Soft Bobbins When Barber Tape is Used

Barber tape is of just the proper weight and construction to insure smooth, steady operation. They had to be perfect, or the name Barber would never have been put on them and the fact that they are preferred is proved by the fact that 90% of new tape drive cotton frames, put on the market in the past ten years have been equipped with Barber Tapes.

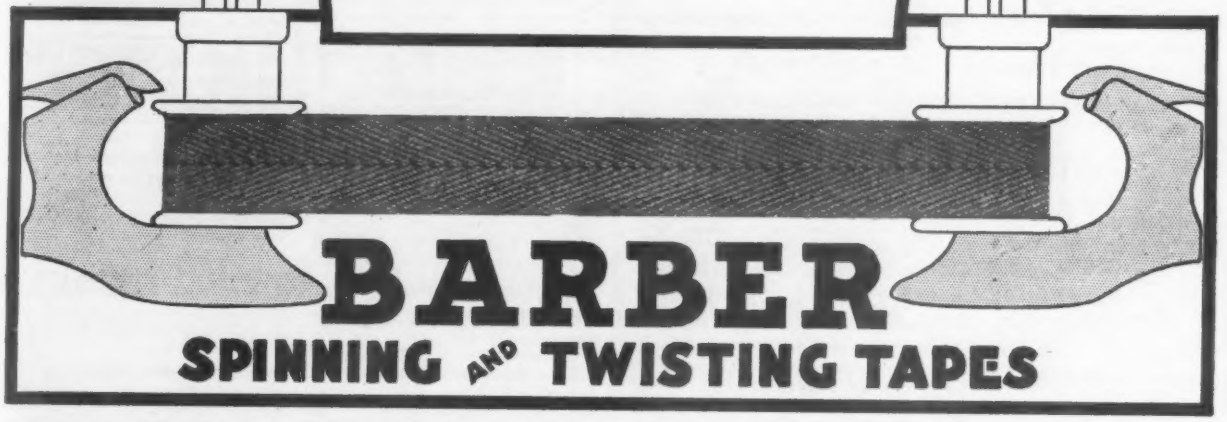
Barber Tapes have the quality of materials, quality of workmanship and a long established reputation to maintain that is assurance to the country's leading textile engineers that they are the best that can be secured.

And Barber service is prompt and satisfying. Write or wire for prices.

Barber Manufacturing Co.

Spinning Tape Specialists

Lowell, Mass.



BARBER

SPINNING AND TWISTING TAPES

Spiker & Lose

ENGINEERS

Reports, estimates, appraisals, plans, supervision and consultation on all classes of reinforced concrete, steel and timber structures. Specialty — mills, warehouses, industrial and hydro-electric developments.

519-20 Forsyth Bldg., Atlanta, Ga.

Shafts, Pulleys, Hangers, Belting Packing, Lacing

BOILERS

For Mills and Public Works. Low Prices

Tanks, Stacks, Smoke Flues, Boiler Tubes, Pipe, Valves, Fittings, Kerosene and Gasoline Engines, Wood Saws, Pumps, Heaters, Injectors, Engine Supplies and Repairs for Mills, Hotels, Public Works.

Iron and Brass Castings Cast Every Day.

LOMBARD Foundry, Machine, Boiler Works, and Supply Store

AUGUSTA, GEORGIA

CORTRIGHT METAL SHINGLES

You can lay them right over the old roof

—And as to the durability of Cortright Metal Shingles—

Some laid 33 years ago are still tight.

B Y C
TRADE MARK

BARBER-COLMAN COMPANY

Main Office and Factory

Rockford, Ill.

Boston, Mass. Greenville, S. C.

WARP TYING MACHINES

WARP DRAWING MACHINES

HAND KNOTTERS FOR SPOOLING AND WINDING

Advertisers' Index

Aberfoyle Mfg. Co. 742
Alabama Power Co. ....20 and 21
Aldrich Machine Works 274
Allis-Chalmers Mfg. Co. 277
American Appraisal Co. 280
American Audit Co. 280
American Cement Paint Co...268
American Laundry Machinery Co. 257
American Machine Co., H. & B.703
American Moistening Co. .... *
American Scrubbing Equipment Co. 257
American Supply Co. 260
American Textile Banding Co., Inc. 752
American Water Softener Co...287
American Yarn & Processing Co. 279
Anchor Post Iron Works 712
Arkray Mills, Inc. 278
Arlington Cotton Mills 278
Arnold, Hoffman & Co. 250
Arrow Mills, Inc. 278
Atlanta Harness & Reed Mfg. Co. 726
Atlanta Brush Co. 263
Atlanta National Bank 279
Atlanta Rubber Stamp & Stencil Works 280
Atlanta, Birmingham & Atlantic Railroad 282
Atlanta & West Point Railroad 282

Barber-Colman Co. 295
Barber Mfg. Co. 295
Barrett Mfg. Co. 701
Bayley Mfg. Co. 260
Beer Co., H. & B. ..s.....281
Belger Co. 261
Birmingham Slag Co. 19
Bird-Potts Co. 274
Blake Electric Mfg. Co. ..... *
Boger & Crawford 280
Bond & Co., Chas. 722
Borne, Scrymser Co. 255
Bosson & Lane 248
Bowser & Co., Inc., S. F. 32
Bradley Mfg. Co., A. J. 752
Brandwood, John 253
Briggs-Shaffner Co. 297
Brinton Co., H. 740
Bromberg Attractions, Arthur Co. 24
Brooks & Doxey (1920) Ltd.. 7
Brown Co., A. & F. 275
Buckeye Blower Co. 724
Burt Mfg. Co. 270
Butterworth & Sons Co., H. W.245
Byrd Printing Co. 266

Carlyle-Johnson Machine Co...272
Carrier Engineering Corp. ...297
Carter Electric Co. 276
Carver-Beaver Yarn Co. 280
Chicago Bridge & Iron Co. ..287
Ch sholm-Moore Mfg. Co. 272
Ciba Co., Inc. 252
Citizens & Southern Bank ...281
Clasified Opportunities 284 & 285
Clements Mfg. Co. 297
Cocker Machine & Foundry Co.246
Cole Mfg. Co., R. D. 297
Collins, J. D. 297
Columbia Novelty Mfg. Co. ..293
Commercial Acetylene Supply Co. 726
Corn Products Refining Co. ...251
Cornell Wood Products Co. ...269
Cortright Metal Roofing Co....295
Crane Co. 33
Cresson-Morris Co. 274
Crompton & Knowles Loom Works 18
Curtis, Paul W. 293
Curtis Pneumatic Machinery Co.271
Cutter Works, George ..... *

D-A Lubricant Co. 273
Davis, Roger W. 14
Dixie Culvert & Metal Co. ...299
Dixie Portland Cement Co. ...268
Dixie Mercerizing Co. 752
Dixon Crucible Co., Jos. 726
Dodge Sales & Eng. Co. 300
Dowman-Wilkins Printing Co..297
Draper Corporation 3
Drouve Co., G. 269
Dufur & Co. 289
Du Pont de Nemours Co., E. I.249

East Jersey Pipe Co. 244
Eclipse Textile Devices 264
Economy Baler Co. 293
Electric Smelting & Aluminum Co. 752
Electro Bleaching Gas Co. ...297
Emmons Loom Harness Co. ..291
Ernst & Ernst 708
Estes Surgical Supply Co. ...293

Fabreeka Belting Co. 273
Fafnir Bearing Co. 6
Famous Mfg. Co. 293
Fawcett, Hughes 278
Federal Electric Co. 277
Federated Films Co. of Atlanta 24
Firsching Co., J. A. 726
Flexible Steel Lacing Co. 293
Fletcher Works 9
Flint Mfg. Co. 278
Florsheim, H. A. 278
Ford Co., J. B. 254
Foundation Co., The 38
Foxboro Co. 247
Franklin Process Co. 2

Gallaudet Aircraft Corp'n 265
Garland Mfg. Co. 730
General Electric Co. ..... *
General Machine Works 748
Georgia Railroad 282
Georgia Railway & Power Co. *
Goulds Mfg. Co. 287
Grassel'i Chemical Co. 250
Gray Mfg. Co. 278
Greist Mfg. Co. 261
Grinnell Co. 40

Hauser-Stander Tank Co. 752
Hemphill Co. 736
Hightower Box & Tank Co....256
Hotel Cecil 283
Hotel Claridge 283
Hotel Martinique 283
Hotel Sinton 282
Hotel Tuller 283
Hough Shade Corp. 748
Howard Adv. Agency 259
Howard & Bullough Amer. Mach. Co. 708
Hunt Machine Co., Rodney ... *
Hunter Mfg. & Com. Co. ..... *
Huntington & Guerry, Inc. ... *
Hyatt Roller Bearing Co. 42

India Alkali Works 258
International Eng'g Works ... *
Ivanhoe-Regent Works of G. E. Co. 39

Jacobs Mfg. Co., E. H. 258
Jenkins Bros. 276
Johnson & Co., Oliver 36
Jordan Mfg. Co. 726

Kali Mfg. Co. 254
Keever Starch Co. 252
Klauder-Weldon Dyeing Mach. Co. 248
Knapp Fence Co. 730

Lamson Oil Co. 265
Lane & Co., J. H. ..... *
Lestershire Spool & Mfg. Co...263
Lewis, G. B. 258
Lidseen 270
Link-Belt Co. 28
Lombard Fdry. & Mach. Works295
Lord Bros. 7
Lupton's Sons Co., David 297
Lyon Metallic Mfg. Co. 17

Macomb Machine Co. 244
Mason, Volney W. 289
Masury-Young Co. 291
Mates-Brown Co., Inc., B. P...248
Merrow Machine Co. 742
Metz Co., H. A. 718
Miles Refrigerating Co. 5
Monroe Calculating Machine Co. 710
Moore Oil Refining Co. ..... *
Morehead Mfg. Co. 293
Morse Chain Co. 30
Mossberg Pressed Steel Corp... *
Myrtle Mills, Inc. 278

Nashville Industrial Corporation 285
National Aniline & Chemical Co. 1
National Merchandise Fair ... 15
National Shawmut Bank 280
Newport Chemical Co. 720
New York & New Jersew Lubricant Co. 275
Norwood Engineering Co. 248

O'Malley & Carroll 260
Oster Mfg. Co. 274
Oxweld Acetylene Co. 714

Packard Motor Car Co. ..... *
Palmer Co., I. E. 264
Parks-Cramer Co. 13
Parkdale Mills, Inc. 278
Pearson, Jos. T. 748
Phila. Drying Machinery Co...256
Philadelphia Felt Co. 256
Powers Regulator Co. 270
Power Mfg. Co. 267
Proctor & Schwartz, Inc. 247

Reliance Machine Works 748
Roberts & Co. 35
Roessler & Hasslacher Chemical Co. 728
Rose Bros. & Co. 293
Ross-Gould Co. 266
Roy & Son Co., B. S. 14
Rundle-Spence Mfg. Co. 269

Saco-Lowell Shops 14
Sandoz Chemical Co. 243
Sanitas Co. 289
Sanymetal Products Co. 708
Sargent's Sons Corp., C. G....246
Savini Films, Inc., R. M. 24
Scaife & Sons, Wm. B. 289
Schaum & Uhlinger 9
Schofield's Sons Co., J. S.....276
Schofield Co., Wm. 287
Scott & Williams 733
Shambow Shuttle Co. 18
Showalter Printing Co., A. J...266
Sirrine Co., J. E. 37
Skayef Ball Bearing Co. 4
Smith & Furbush Machine Co.265
Smith & Bros. Typewriter Co., L. C. 266
Sonneborn Sons, Inc., L. 255
Southern Bending Co. ..... *
Southern Cypress Mfg. Asso... 34
Southern Ice Machine Co. ... 23
Southern Railway System ...282
Southern Spindle & Flyer Co...258
Southern States Film Co. 24
Southern Theatre Equip. Co... 25
Southern Wood Preserving Co.724
Southwestern Broom Mfg. Co.264
Spiker & Lose 295
Stafford Co. 8
Staley Mfg. Co., A. E. 255
Standard Fibre Co. 287
Standard Gas Products Co. ..275
Stearns, Wm. Taylor 752
Steel Heddle Mfg. Co. 722
Stuhrman, Edw. A. 716
Surtass Chemical Co. 243
Suter, Alfred ..... *
Sydnor Pump & Well Co. 289

Taylor Co., Halsey W. 267
Taylor Instrument Co. 247
Terrell Machine Co. 260
Texas Co. 31
Texas & Pacific Railway 281
Textile Service & Equipment Co. 720
Textile Hall Corp. 270
Textile Specialty Co. 12
Thompson & Binger, Inc. .... *
Tolhurst Machine Works 705
Toomey, Frank, Inc. 284
Trump Bros. Machine Co. 740

United Chemical Products Co.289
Universal Winding Co. 734
U. S. Ball Bearing Co. 27
U. S. & Cuban Allied Works Eng'g Corp. 724

Vermont Spool & Bobbin Co...262
Vogel Co., Jos. A. 268

Wadsworth, Howland & Co., Inc. 243
Walke Box Co. 752
Walraven Co., The ..... *
Walsh & Weidner Boiler Co...276
Want Ads 284
Warren Soap Mfg. Co. 730
Weimar Bros. 278
Westinghouse Electric & Mfg. Co. .....10 and 11
White Co. 22
Whitinsville Spinning Ring Co.262
Whitin Machine Works 16
Wildman Mfg. Co. 738
Williams & Sons, I. B. 29
Williams Co., J. H. 16
Wolf & Co., Jacques 254
Wood's Sons Co., T. B. 26
Woodward, Baldwin & Co. ...278

FIGHT "DUSTRUCTION"

WITH A
CADILLAC
Portable Electric
BLOWER

Blows dust out of motors, generators, switchboards and other delicate machinery.

Can be equipped to draw dust and lint from cards, slubbers, spinning looms, napping machines, shearing machines, etc.

Write for illustrated folder giving prices, etc.

Attach to any light socket. Weight 6 lb.

CLEMENTS MFG. CO.
612 Fulton St., Chicago

Elevated Tanks
Boilers, Engines
Castings
Hosiery Dye Machines

R. D. Cole Mfg. Co.
Newnan, Ga.

Liquid EBG Chlorine

Our container equipment includes 100 and 150 pound Cylinders, Ton Drums, and Tank Cars.

Electro Bleaching Gas Co.
PIONEER MANUFACTURERS of LIQUID CHLORINE
Plant: NIAGARA FALLS, N.Y.
Main office 18 East 41st Street New York. *Chicago office* 1i So. La Salle St.

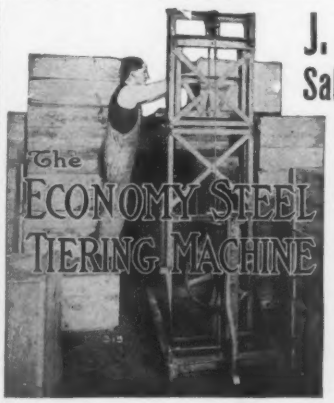
Carrier Engineering Corporation
750 FRELINGHUYSEN AVE., NEWARK, N. J.
Boston Buffalo Philadelphia Chicago New York

AIR CONDITIONING
(Manufactured Weather)

HUMIDIFICATION CLEANING
WINTER HEATING SUMMER COOLING

We will be glad to tell you why and how nearly two hundred of the finest mills in the U. S. are making "Every day a *good* day" with.

CARRIER EQUIPMENT



J. D. Collins Sales & Eng'g. Co.

STORAGE AND INDOOR TRANSPORTATION EQUIPMENT
55½ Luckie St.
Atlanta, Ga.

Equipment that will reduce your storage and handling expenses. Tiering Machines, Electric and Hand Trucks, Overhead Carriers, Gravity and Power Conveyors of all kinds.

Catalogs and full information furnished upon request

Steel Shelving

Lupton
INVESTMENT VALUE
PHILADELPHIA

Factory Equipment
From Warehouse Stocks

David Lupton & Sons Co.
Philadelphia

For Printing of
BOOKLETS
PUBLICATIONS and
HOUSE ORGANS

Write

Dowman-Wilkins Printing Co.
107-109 Luckie Street Atlanta, Ga.

COTTON MILL REPAIRS

SEND SAMPLES OF PARTS WANTED AND GET OUR PRICES. YOU DON'T HAVE TO BUY.

WE WILL SAVE YOU TIME

AND WON'T EXPECT YOUR ORDER IF WE CAN'T

SAVE YOU SOME MONEY TOO

Briggs-Shaffner Company

WINSTON-SALEM, N. C.

MACHINE WORK FOUNDRY WORK

MAIN OFFICE AND WORKS
PROVIDENCE, R. I.

NEW YORK OFFICE
HUDSON TERMINAL BLDG.

THE TEXTILE-FINISHING MACHINERY CO

CANADIAN REPRESENTATIVES
WHITEHEAD, EMMANS, LTD.
MONTREAL

SOUTHERN REPRESENTATIVE
H. G. MAYER
CHARLOTTE, N. C.

Your Inquiries Solicited for

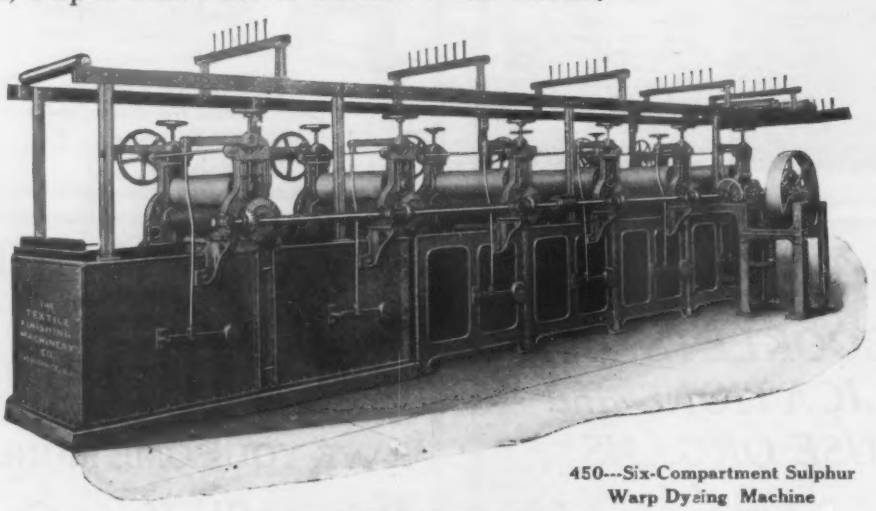
MACHINERY

of All Kinds and Types for Bleaching, Dyeing, Drying
Mercerizing and Finishing
Piece Goods and Warps

—o—

Our Specialties Are:

Upright and Horizontal Dryers, Warp Mercerizing Machines, Singers, Kiers, Washers, Squeezers, Scutchers, Dye Jiggs, Mangles, Calenders, Tenters, Color and Size Kettles, Warp Dyeing Machinery, Elastic Web and Narrow Fabric Finishing Machinery, and Calender Rolls of Cotton, Husk, Paper and Patent Combination Stock.



450---Six-Compartment Sulphur
Warp Dyeing Machine

ADDRESS ENQUIRIES DEPT. P.

PLANS AND ESTIMATES FOR COMPLETE PLANTS AND SPECIAL MACHINERY.

Permanently Good Roadbeds Depend on Culverts You Use

A Culvert that is quickly handled by unskilled labor—

That is unbreakable—uncrushable—uninjurable by any of the elements—

That will last unimpaired for years on years—

Is unquestionably the most efficient and economical type of culvert to use.

ARMCO INGOT IRON CULVERTS

embody every element of efficiency and economy and are O Kayed by a continually increasing host of engineers because they overpass the severest tests of drainag requirements.

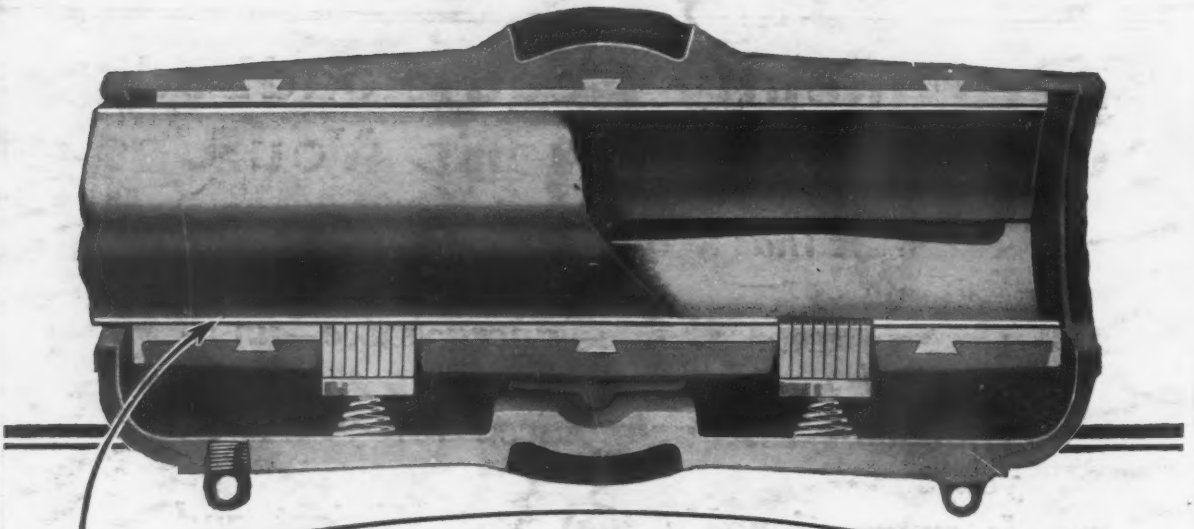
Mill Town Installation of Armco Ingot Iron Culverts doing continuous heavy duty with assured long years of uninterrupted service without maintenance expense.

Streets and highways of every kind of surface construction, equipped with Armco Ingot Iron Culverts, are always in the best of traffic-fit condition.

We have a department that specializes on mill town street drainage. We invite you to ask this department's help on your drainage problems.

DIXIE CULVERT & METAL CO.

ATLANTA, GEORGIA



The shaft revolves on a film of oil

Nature's infallible law of capillary attraction provides a continuous, uniform and unbroken film of oil between the shaft and bearing lining—holding apart these two surfaces whose contact invariably means friction loss, wear on bearing and ultimate disalignment of shafting.

There are no moving parts in this bearing—it is designed and constructed to successfully operate under the highest practical speeds—will give a life time of service and is so guaranteed.

Anyone can erect a Dodge bearing—anyone can maintain it in use. The large oil reservoir requires filling but once every six months.

You can buy Dodge Capillary Bearings as well as every other item of the complete Dodge line, including hangers, pulleys, collars and clutches, from your local dealer on the immediate delivery basis.

DODGE

Dodge Sales and Engineering Company.

General Offices: Mishawaka, Ind. Works: Mishawaka, Ind. and Oneida, N.Y.

Power Transmission Machinery-Elevating and Conveying Equipment-Heavy Oil Engines

New York
Philadelphia
Pittsburgh
Boston
Cincinnati
Newark
Chicago
Atlanta
Minneapolis
St. Louis
Houston
Seattle
San Francisco